E.O. Lawrence Berkeley National Laboratory
University of California
Environmental Restoration Program

United States Department of Energy

REQUEST FOR NO FURTHER INVESTIGATION (NFI) STATUS

for

BUILDING 51 SANITARY SEWER AND DRAINAGE SYSTEM

(AOC 9-9)

for the

Lawrence Berkeley National Laboratory

ENVIRONMENTAL RESTORATION PROGRAM

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A Joint Effort of
Environment, Health and Safety Division, and
Earth Sciences Division,
Lawrence Berkeley National Laboratory
University of California
Berkeley, California 94720

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CONTENTS

LIST OF ABBREVIATIONS

AOC	Area of Concern
Berkeley Lab	Lawrence Berkeley National Laboratory
Cal/EPA	State of California Environmental Protection Agency
CAP	Corrective Action Program
CMS	Corrective Measures Study
COPCs	Chemicals of Potential Concern
DCA	dichloroethane
DCE	dichloroethene
DTSC	Department of Toxic Substances Control (Cal-EPA)
EBMUD	East Bay Municipal Utilities District
GAC	granular activated carbon
ICMs	Interim Corrective Measures
MCLs	Maximum Contaminant Limits
μg/L	micrograms per liter
mg/kg	milligrams per kilogram
NFA	No Further Action
NFI	No Further Investigation
PAHs	polycyclic aromatic hydrocarbons
PCBs	polychlorinated biphenyls
PCE	tetrachloroethene (perchloroethylene)
PRGs	preliminary remediation goals
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
SVOCs	semi-volatile organic compounds
SWMU	solid waste management unit
TCA	trichloroethane
TCE	trichloroethene
TPH	Total Petroleum Hydrocarbons
USEPA	United States Environmental Protection Agency
VOCs	volatile organic compounds

SECTION 1

INTRODUCTION

1.1 PURPOSE

The purpose of this report is to document the environmental investigations conducted at the Building 51 Sanitary Sewer and Drainage System (Area of Concern [AOC] 9-9), and request approval of No Further Investigation (NFI) status for AOC 9-9 under the Resource Conservation Recovery Act (RCRA) Corrective Action Program (CAP) at Lawrence Berkeley National Laboratory (Berkeley Lab). The California Environmental Protection Agency (Cal/EPA) Department of Toxic Substances Control (DTSC) is the lead regulatory agency for the CAP and has the authority to approve NFI status for this unit. If NFI status is approved, no additional site characterization will be required; however, the unit will still be included in the site-wide risk assessment. A map of Berkeley Lab showing the location of AOC 9-9 is included as Figure 1.

1.2 CHRONOLOGY OF REGULATORY REVIEW OF AOC 9-9

Berkeley Lab previously submitted a request to the DTSC for approval of NFI status for AOC 9-9 in January 1999 (Berkeley Lab, 1999a). Following is the chronology of Berkeley Lab's previous submittal, DTSC's comments on the request, and Berkeley Lab's responses to comments.

- January 1999 — Berkeley Lab submitted a request for No Further Action (NFA) or NFI Status for selected Solid Waste Management Units (SWMUs) and AOCs, including AOC 9-9 (Berkeley Lab, 1999a).
- April 1999 — DTSC provided comments on Berkeley Lab's request in a Notice of Deficiency (DTSC, 1999a).
- May 1999 — Berkeley Lab responded to the comments in the Notice of Deficiency (Berkeley Lab, 1999b). Berkeley Lab stated that additional site characterization work for AOC 9-9 would be proposed in a workplan that would be submitted to DTSC for review and approval.

- December 1999 Berkeley Lab submitted a workplan to DTSC for further investigation of the Building 51 Sanitary Sewer and Drainage System (Berkeley Lab, 1999c)

- February 2000 DTSC approved Berkeley Lab's workplan (DTSC, 2000).

1.3 SCOPE

Several concurrent investigations and Interim Measures (IMs) were conducted at AOC 9-9 between November 1990 and February 2000. The objectives of these activities were:

- To identify the source of contamination and contaminant migration pathways
- To evaluate the magnitude and extent of contamination
- To reduce the potential impact to soil and groundwater
- To remove accessible soil with concentrations of polychlorinated biphenyls (PCBs) above 1 mg/kg (the United States Environmental Protection Agency's [USEPA]) self-implementing cleanup level ("walk away" level) for soil in high occupancy areas (USEPA 1998).

The history of the site and the geology and hydrogeology are described in Section 2 of this current NFI request. The environmental investigations and (IMs) that have been conducted at the site are summarized in Section 3. The summary includes information contained in the January 1999 NFI approval request (Berkeley Lab, 1999a) and the December 1999 workplan (Berkeley Lab, 1999c). In addition, the results of the environmental activities conducted in accordance with the December 1999 workplan are reported in Section 3. The rationale for requesting NFI status for AOC 9-9 is provided in Section 4.

SECTION 2

DESCRIPTION OF UNIT

2.1 SITE DESCRIPTION AND HISTORY

A variety of oil-containing equipment was operated and/or stored in the Motor Generator Room of Building 51 (the Bevatron) and its basement, including oil pumps, capacitors, and transformers. There were also two oil pumps in the basement that delivered oil to the motor generators on the main floor.

The configuration of the subfloor drainage system for the Building 51 Motor Generator Room basement is shown on Figure 2. The system consists of a terra cotta subdrain approximately 1.5 feet below the basement floor and a parallel cast iron pipe at a depth of 4 to 5 feet. The cast iron pipe is part of a larger drainage system that collects water from the Building 51 complex and empties into a discharge sump located at the north end of the Motor Generator Room basement. Several wells and subdrains are used to dewater the hillside immediately east of Building 51. This dewatering system discharges to the filter sump at the south end of the Motor Generator Room basement. Water from the filter sump is conveyed through the cast iron pipe to the discharge sump. The underground utility drawings for Building 51 indicate that the terra cotta drain and the cast iron pipe are not connected. However, a connection was discovered at the north end of the basement in 1999, when the two drain lines were exposed.

During most of its history, the effluent from the discharge sump was discharged to the sanitary sewer. However, prior to 1962, and for a period between 1994 and 1996, when contaminants were not detected in the effluent, the sump contents emptied to the storm drain system that discharges to North Fork Strawberry Creek. Currently, the effluent from the discharge sump is treated by a granular activated carbon (GAC) system and discharged to the sanitary sewer under Berkeley Lab's East Bay Municipal Utility District (EBMUD) discharge permit.

On November 12, 1990 during a routine inspection, Berkeley Lab personnel observed that water in the filter sump was covered with black oil that was found to contain PCBs. Based on this occurrence, the DTSC RCRA Facility Assessment (RFA) (DTSC, 1991) identified the Building 51 PCB Spill Sumps and Drainage system as AOC #1. The Berkeley Lab RFA (Berkeley Lab, 1992) identified the filter sump as Solid Waste Management Unit (SWMU) 9-6. Berkeley Lab later designated the impacted section of the drainage line and the discharge sump as AOC 9-9, which is the subject of this NFI request. DTSC has approved NFI status for SWMU 9-6 (DTSC, 1999b), based on a previous request (Berkeley Lab, 1999d).

2.2 GEOLOGY AND HYDROGEOLOGY

The bedrock geology of the Building 51 area is shown on Figure 3. Depth to bedrock is approximately 1.5 to 2 feet below the top of the concrete floor in the Motor Generator Room basement. The bedrock is composed of interbedded silty claystone, clayey siltstone, and sandy siltstone of the Orinda Formation. The rock is generally intensely fractured, friable, of low hardness, and little weathered. The basement is located approximately 75 feet east of the geological contact between the Orinda Formation and the Great Valley Group, which underlies the Orinda Formation.

As observed in test pits in the Motor Generator Room basement, depth to groundwater varies from approximately 2 to 5 feet beneath the floor. A water level elevation map of the Building 51 area is shown on Figure 3, and indicates that groundwater flows generally westward. However, it is likely that local groundwater flow directions beneath the basement may be deflected towards the permeable backfill surrounding the drain lines.

The Orinda Formation has a hydraulic conductivity of 10^{-7} to 10^{-9} meters per second, based on lab-wide slug tests performed in monitoring wells. This is the lowest range of hydraulic conductivities measured at Berkeley Lab.

SECTION 3

ENVIRONMENTAL ACTIVITIES

3.1 SCREENING PROCESS FOR NFA OR NFI STATUS

To evaluate which soil sample data might represent environmental contamination, sample analytical results are compared to background levels of chemicals. For compounds that are not naturally occurring, such as many organic compounds, background levels are assumed to be zero, and any detected concentration is assumed to represent contamination, unless potential sample contamination (e.g., laboratory contamination) can be documented. For naturally-occurring constituents such as metals, analytical results are compared to statistically-estimated maximum background levels to identify, to a specified degree of confidence, which constituents are present at concentrations that represent contamination. These statistically-estimated maximum background levels were developed for Berkeley Lab by applying the upper tolerance limit method (USEPA, 1989) to general metals sampling data collected at Berkeley Lab (Berkeley Lab, 1995).

As approved by the DTSC, Berkeley Lab uses USEPA Region IX Preliminary Remediation Goals (PRGs) (USEPA, 1999) as a screening tool to help assess whether further action is required at a site (i.e., whether the unit will be included in the site-wide risk assessment). DTSC PRGs (Cal-Modified PRGs) are used where Region IX PRGs either have not been established, or are greater than the DTSC values. As a conservative measure, PRGs for soil *at residential sites* are used in lieu of the less-stringent PRGs for soil *at industrial sites*.

SWMUs or AOCs where sufficient sampling data have been collected to characterize the magnitude and extent of any contamination and soil contaminant concentrations are less than Berkeley Lab maximum background levels or below PRGs for residential soil are recommended for no further action (NFA) status. If, however, soil contaminant concentrations are greater than both Berkeley Lab maximum background levels and PRGs for residential soil, the unit is recommended for no further investigation (NFI) status.

No further site characterization is required by DTSC for SWMUs and AOCs approved for either NFA or NFI status, and units that are approved for NFA status will not be included in the Corrective Measures Studies (CMS) phase of the RCRA CAP. However, SWMUs and AOCs approved for NFI status will be included in the site wide risk assessment to be conducted as part of the CMS.

3.2 SUMP AND DRAINLINE SAMPLING AND WATER TREATMENT

Investigation and IM activities for AOC 9-9 were initiated in November 1990, when PCB-containing oil was found in the filter sump. Samples collected from the filter sump at that time contained PCBs at maximum concentrations of 110 μg/L (water), 110 mg/kg (oil product), and 3,700 mg/kg (sludge) (Kaldveer Associates, 1991). The oil apparently originated from blown capacitors stored in the basement.

A subsequent survey (Kaldveer Associates, 1991) indicated that lines draining into the filter sump (Lines J and K) and lines downstream from the filter sump (lines A, B, and parts of C, D, and F) contained an oil product. Oil contamination was not detected in the remainder of the building's drain system that was accessible to inspection. The system was flushed, and more than 1,300 gallons of contaminated water were removed, containerized and disposed.

Beginning in November 1990, effluent from the discharge sump was pumped to a GAC system for treatment. Treated effluent from this system was used as makeup water for the Building 51 cooling towers. Eight water samples were collected from the treatment system influent line between March to November 1993. Three of the samples were analyzed for VOCs and five for PCBs. Neither VOCs nor PCBs were detected; therefore, water treatment was discontinued. The floor drains in the building were sealed and the effluent from the discharge sump rerouted to the storm drain.

In May 1996, PCBs and oil & grease were detected in sediment samples collected from the filter and discharge sumps. Based on these results, water treatment was resumed, and treatment system effluent was routed to the sanitary sewer. Results of sampling sediment and water in the sumps and drain line are included in Table 1a (organic compounds) and Table 1b (metals).

3.3 INITIAL EVALUATION OF CONTAMINATION AND POTENTIAL RELEASE ROUTES

An Addendum to the RCRA Facility Investigation Workplan (Phase III) for investigation of the Building 51 (Bevatron) complex was submitted to the regulatory agencies in March 1996 (Berkeley Lab, 1996). The addendum proposed sampling to evaluate whether potential releases from the building's interior drain lines had impacted surrounding soils. In accordance with the addendum, the following borings were drilled and sampled.

Locations of Initial Borings in Motor Generator Room Basement

Boring Number	Location
SB51-96-5	Adjacent to discharge sump
SB51-96-6	Adjacent to the filter sump
SB51-96-7 to SB51-96-10	Adjacent to drain line
SB51-96-11	Adjacent to the former oil pump location on west side of basement
SB51-96-12	Adjacent to the drain line and former oil pump location on the east side of basement

The locations of these borings are shown on Figure 4. The soil analytical results are included in Table 2a (organics) and Table 2b (metals). Total petroleum hydrocarbons (TPH) in the range of motor oil and oil & grease were detected in most samples (11,000 mg/kg maximum concentration). PCBs were detected in SB51-96-12 (3.0 mg/kg maximum) and SB51-96-8 (23 mg/kg maximum) adjacent to the northern section of the drain line. No VOCs were detected.

Three of the soil borings (SB51-96-6, SB51-96-8, and SB51-96-12) were converted to temporary groundwater sampling points. Analytes detected in groundwater samples collected from SB51-96-8 and SB51-96-12 in April 1996 included PCBs and oil & grease (Table 4).

Also in accordance with the March 1996 addendum, Test Pit 1 was excavated at a location where a video survey had indicated blockage of the cast iron drain line. The purpose of the test pit was to verify the locations and depths of the terra cotta and cast iron drain lines, and investigate whether the area of blockage was as a source of releases of contaminants to the environment. The location of the test pit is shown on Figure 4. A plan view and cross section of Test Pit 1 showing the configuration of the drain lines and sampling locations and results is presented on Figure 5. Soil analytical results are included in Table 2a (organics) and Table 2b (metals). No contaminants were detected in soil samples collected from the bedrock, including samples collected adjacent to the cast iron pipe. The sample (SS-51MRPit-96-6) collected from soil immediately beneath the terra cotta drain contained PCBs (0.61 mg/kg) and TPH in the range of motor oil (170 mg/kg). Samples of black chips from the underside of the concrete (SS-51-MRPit-96-3) contained PCBs (1 mg/kg of Aroclor-1260). The Aroclor-1260 contamination is apparently the result of a thin layer of oil that was applied as a moisture barrier on top of the base rock.

3.4 SOURCE INVESTIGATIONS

Test Pit 2 November 1996

In November 1996, Test Pit 2 was excavated along the drain lines between the two former oil pumps (Figure 4). The purpose of the test pit was to evaluate whether the former oil pumps or drain lines in this area could be the source of the PCBs and oil & grease detected in groundwater samples from boring SB51-96-12. Four soil samples (SS-51MRP2-1 through SS-51MRP2-4) and one sample of product seeping into the east side of the pit (SS-51MRP2-PROD) were collected.

PCBs were detected in a sample collected from the oil layer forming an apparent moisture barrier immediately beneath the concrete floor. PCBs, oil & grease, and TPH in the range of motor oil were detected in the soil sample (SS-51MRP2-4) collected below the terra cotta drain (Figure 6, Table 2a). No VOCs were detected. The product seeping into the pit contained PCBs and hydraulic/motor oil (Table 3). Based on the analytical results and inspection of the cast iron pipe, the source of the contamination did not appear to be in the area of this Test Pit 2.

Test Pit 3 1997 and 1998

A second Addendum to the RCRA Facility Investigation Workplan (Phase III) was submitted to the regulatory agencies in January 1997 (Berkeley Lab, 1997). This addendum specified that a third test pit be excavated along the drain lines north of Test Pit 2, near temporary groundwater sampling point SB51-96-8, in the area of maximum detected soil and groundwater PCB concentrations (Figure 4). The purpose of this test pit was to help evaluate the source and assess the extent of the contamination previously detected in the soil and groundwater.

Test Pit 3 was excavated in stages starting in April 1997. During the initial excavation of the pit only composite samples were collected from excavated soil for disposal purposes. Analytical results from these samples were comparable to concentrations detected in the previous two test pits.

The pit was deepened to 7.5 feet in July 1998 in order to expose the terra cotta and cast iron drain lines for inspection and allow the collection of soil samples beneath drainlines. Water and product (oil or sludge) were observed seeping into the test pit at several locations. A sample of the product contained PCBs, TPH in the range of hydraulic/motor oil, and several polynuclear aromatic hydrocarbons (PAHs) (Table 3).

Soil samples (SS-51MRPit3-98-1 through SS-51MRPit3-98-10) were collected from the walls and floor of the excavation. A plan view and cross sections of Test Pit 3 showing the drain line configurations and soil sample results are presented on Figure 7a, Figure 7b, and Figure 7c. Soil samples (SS-51MRPit3-98-1 through SS-51MRPit3-98-10) contained PCBs up to 14 mg/kg and TPH in the range of hydraulic/motor oil up to 4,600 mg/kg (Table 2a). No mercury was detected (Table 2b).

<u>Borings SB51-98-1 to SB51-98-9 February and June 1998</u>

In February and June 1998, soil samples were collected from soil borings (SB51-98-1 through SB51-98-9) in the Motor Generator Room basement (Figure 4). The purpose of these borings was to characterize soil contamination both adjacent to and away from the drain lines, and provide additional information on the source of the contamination. TPH in the range of hydraulic/motor oil and crude/waste oil was detected at a maximum concentration of 2,000 mg/kg (Figure 8, Table 2a). Two PCB compounds were detected: Aroclor-1242 was detected in several samples, with the maximum concentration (0.29 mg/kg) found adjacent to the drain line at the north end of the basement; Aroclor-1260 was detected in the oil layer forming an apparent moisture barrier immediately beneath the concrete floor. No VOCs were detected. Mercury (0.89 mg/kg) was only detected in one sample (Table 2b). Concentrations of PCBs generally decreased with distance from the drain line, indicating that the drain line was the source of the contamination.

Former Oil Pumps April 1999

The locations of the former oil pumps are shown on Figure 2. In April 1999, two samples of oil from the western oil pump (located west of Test Pit 2) were analyzed for PCBs. PCBs were not detected (Table 3). When the abandoned eastern oil pump (located east of Test Pit 2) was removed, the concrete pad under the pump was observed to be heavily stained with oil. The concrete pad was therefore removed and soil samples were collected from ten borings (51MRP4-SB1 through 51MRP4-SB10) under the former pad location (the planned location for Test Pit 4). The locations of the borings are shown on Figure 4 and Figure 9. Soil samples collected from the borings contained TPH in the range of hydraulic motor oil or diesel up to 28,000 mg/kg and PCBs up to 0.54 mg/kg (Table 2a, Figure 9). PCBs were detected in only 4 of 29 samples. The sampling was conducted to investigate whether the oil pump could have been a source of the PCB contamination detected in soil and groundwater beneath the basement. The results indicated that the oil pumps were not the source of the contamination.

Area of Wall Stains April 1999

On April 28, 1999, two wipe samples (51MR-99WALLWIPE-1 and -2) were collected from the oil-stained concrete basement wall east of Test Pit 3. The staining was observed below holes in the wall that had previously held electrical conduits. The sampling was conducted to assess if this oil could have been the source of the PCB contamination detected in the soil and groundwater. PCBs were not detected, indicating that this was not the source. TPH in the range of crude/waste oil was detected (Table 3).

Test Pit 3 1999 and 2000 Source Identification

Several rounds of confirmation sampling and enlargement of Test Pit 3 were conducted between June 1999 and February 2000. Sumps were installed for dewatering the excavation. A soil sample (SS-51MRP3-99-1-7.3) was collected at one of the sump locations in June 1999.

Methylene chloride was the only VOC detected (0.015 mg/kg) (Table 2a and Figure 11). Aroclor-1242 was detected at a concentration of 0.26 mg/kg.

The pit was extended 10 feet toward the north in July 1999 to further investigate the source of the contamination. After the pit was extended, oil was observed seeping into the pit around the backfill of the cast iron pipe on the north wall of the excavation (Photograph 1).

In August 1999, the excavation was extended to the north wall of the basement (Photograph 2 and Photograph 3) to attempt to locate the source of the seep. Near the north wall, the shallow terra cotta tile drain was observed to extend downward and connect to the cast iron pipe (Photographs 3 and 4). The connection is illustrated in cross section on Figure 10. This configuration, which was not indicated on utility drawings, explains the mechanism for the release of the PCBs. In the past, when the pump in the discharge sump was not operating or was being repaired, the water level could rise in the sump. Contaminated water could then back up in the cast iron pipe and, from there, into the terra cotta drain. Since the terra cotta drain is not a solid pipe, any PCB-contaminated water that backed up into the terra cotta drain could be released to the surrounding coarse-grained backfill material around the drain lines.

3.5 MAGNITUDE AND EXTENT OF CONTAMINATION

In December 1999 a workplan was submitted to the regulatory agencies that included provisions for both the evaluation of the magnitude and extent of contamination in the walls and beneath the floor of Test Pit 3 and for the excavation of Test Pit 5 to assess contamination in the soil around the discharge sump (Berkeley Lab, 1999c).

Test Pit 3 Floor and Wall Samples

Soil samples were collected at 21 locations in the walls (SS-51MRP3-99-W1 through SS-51MRP3-99-W21 and SS-51MRP3-99-FW9) and 5 locations beneath the floor (SS-51MRP3-99-F1 through SS-51MRP3-99-F5) of Test Pit 3. One PCB compound (Aroclor-1242), TPH (primarily in the range of hydraulic/motor oil), and thirteen PAH compounds were detected in the soil samples (Table 2a). The detected PAH compounds included benzo(a)pyrene, which was detected slightly above its PRG in two samples. VOCs were not detected. Mercury was not detected (<0.2 mg/kg) (Table 2b).

Concentrations of PCBs detected in the east and west walls of the pit decreased with depth into the walls (distance from the drain lines), except for one location to the west of the drain line (SS-51MRP3-99-W20 on Figures 11). SS-51MRP3-99-W20 is near the connection of the cast iron pipe and terra cotta drain, the apparent source area for the contamination. This area of soil contamination was excavated when Test Pit 3 was subsequently extended to the west wall of the basement. The results were further evidence that the drain lines were the source of the release.

Test Pit 5 Floor and Wall Sampling

Removal of the concrete floor adjacent to the discharge sump and excavation of Test Pit 5 (Figure 4) started in August 1999. A 2-inch diameter hole was observed on the underside of the cast iron drain line when it was exposed in the excavation; however, no visual evidence of oil seepage was observed on the pit walls or floor. The hole in the pipe was repaired.

Soil samples were collected at eight locations in the walls (SS-51MRP5-99-W1 through SS-51MRP5-99-W8) and three locations beneath the floor (SS-51MRP5-99-F1 through SS-51MRP5-99-F3) of Test Pit 5. A number of the soil samples contained PCBs (Aroclor-1242), TPH in the range of hydraulic/motor oil, PAH compounds, and VOCs (Table 2a). Detected VOC concentrations were all less than PRGs, while one PAH compound (benzo(a)pyrene) was detected in one sample at a concentration slightly greater than its PRG. Mercury was not detected (Table 2b). Concentrations of PCBs were less than 1 mg/kg, except for one location that was subsequently excavated. The lateral and vertical distribution of PCBs detected in the test pit are shown on Figures 13 and 14.

Test Pit 2 Area

No confirmation samples were collected from the walls of Test Pit 2 prior to backfilling of the excavation, therefore additional sampling was conducted in February 2000 to ascertain whether contaminants were present adjacent to the backfilled pit. No additional samples were needed along the east wall of test Pit 2 because it was coincident with the west wall of Test Pit 4.

To evaluate the magnitude and extent of contamination immediately west of former Test Pit 2, soil samples were collected from soil borings SB51-MRP2-WW-1A, -2, -2A, -3, and -4 (Figure 4). PCBs (Aroclor-1242) were detected (0.017 mg/kg) in one sample (Table 2a, Figure 9). No PAHs were detected.

3.6 GROUNDWATER SAMPLING

Soil borings SB51-96-6, SB51-96-8, SB51-96-12, SB51-98-1, SB51-98-3, SB51-98-4, SB51-98-5, SB51-98-6, and SB51-98-7 were converted to temporary groundwater sampling points. Except for one detection of Aroclor 1260, Aroclor 1242 has been the only PCB detected in the groundwater (Table 4). In April 1999, groundwater samples were collected from the available temporary groundwater sampling points in the Motor Generator Room basement and three groundwater monitoring wells outside Building 51, including MW51-96-15 downgradient from the Motor Generator Room (Figure 15). PCBs (0.37 μg/L) were only detected at SB51-98-4.

A noteworthy observation is that no PCBs were detected in SB51-98-6. This monitoring point is adjacent to well SB51-96-8, where the maximum concentration of PCBs had been detected in the groundwater prior to excavation of Test Pit 3. Well SB51-96-8 and the surrounding PCB-contaminated soil were removed when Test Pit 3 was excavated. Therefore, based on the April 1999 sampling results, it appears that excavation of PCB contaminated soil from Test Pit 3 has resulted in a marked decrease in PCB concentrations in the groundwater.

Other contaminants detected in groundwater include oil & grease, crude waste oil, and several VOCs (Table 4). Several VOCs [trichloroethene (TCE), cis-1,2-DCE, trans-1,2-DCE, 1,1-DCA, and vinyl chloride] have been detected at concentrations greater than drinking water standards (MCLs). However, since VOCs were detected in only a small fraction of the soil samples collected beneath the Motor Generator Room Basement, AOC 9-9 is interpreted to not be the source of the VOCs detected in the groundwater. Concentrations of VOCs detected in groundwater samples in this area have been below or slightly above drinking water MCLs since 1997. The source of these contaminants is probably the Building 51/64 Groundwater Plume.

3.7 POTENTIAL MIGRATION OF CONTAMINATION TO SURFACE WATERS

As discussed in Section 2.1, the discharge sump has in the past (primarily prior to 1962) been connected to the Berkeley Lab storm drain system. Effluent from the storm drain system near Building 51 is routed to the erosion control basins on North Fork Strawberry Creek, located approximately 700 feet northwest of Building 51 (Figure 16). This is the only known potential migration pathway of contamination from the drainage system to surface waters. North Fork Strawberry Creek is also in the downgradient direction for the groundwater from the Building 51 area. Surface water and sediment samples were collected from North Fork Strawberry Creek between April 1993 and January 2000 and analyzed for contaminants of potential concern from upgradient sources, including AOC 9-9.

Surface water and sediment samples contained no detectable PCBs or PAHs (Table 5a and Table 6a). The only organic analytes detected in surface water were a trace concentration (<1 μg/L) of 1,1,1-trichloroethane (TCA) and diethyl phthalate, which were each detected in one surface water sample at concentrations less than MCLs (Table 5a). No mercury was detected.

The only organic analytes detected in sediment were toluene and oil (Table 5b and Table 6b). Each of these constituents was found in one sediment sample. Toluene was detected at a concentration less than both the USEPA sediment screening level and the PRG. Mercury was detected in one sediment sample at a concentration within Berkeley Lab soil background levels.

The potential impact to the environment from the contaminants detected in surface water and sediment will be evaluated in the ecological risk assessment.

3.8 INTERIM MEASURES (IMs)

Interim Measures (IMs) have been conducted in the basement to reduce the potential impact of contaminants to groundwater and surface water. IMs have included:

- cleaning the drain lines and sumps
- excavating contaminated soil and backfill
- treating the contaminated drain line effluent.

Cleaning the Drain Lines and Sumps

In June and August 1999, the sediment and sludge were removed from the filter and discharge sumps. The interior of each sump was then cleaned with a high-pressure water jet and steam and the cast iron drain line connecting them was cleaned with high-pressure water. A subsequent video survey of the pipe indicated no remaining oil contamination. More than 2000 gallons of contaminated wastewater were generated during these operations and recovered for offsite disposal using a vacuum truck. Photographs of the cleaning operations are shown on Photographs 5, 6, 7 and 8.

The connection of the cast iron pipe to the terra cotta drain line was sealed and the elbow section of the cast iron pipe was replaced with a new section that provides a cleanout access.

Excavating Contaminated Soil and Backfill

Proposed action levels for interim soil removal were included in Berkeley Lab's December 1999 workplan. For VOCs, PAHs, and mercury the proposed action level was the PRG for residential soil. For PCBs, the proposed action level was the USEPA self-implementing cleanup level (1 mg/kg) for soil in high occupancy (i.e., residential) areas (USEPA, 1998).

Test Pit 3

In accordance with Berkeley Lab's December 1999 workplan (Berkeley Lab, 1999c), accessible soil in Test Pit 3 with concentrations of PCBs above USEPA's self-implementing cleanup level for soil in high occupancy areas (1 mg/kg) (USEPA 1998) was removed. The initial excavation was extended to the east, based on analytical results from wall samples and to the west to the Motor Generator Room Basement wall (Figure 11).

In February 2000, additional soil was excavated at a depth of approximately 4 feet under the west wall of Test Pit 3, at the location of the October 1999 wall samples SS-51MRP3-99-W11A and B. This was the location where a product seep was observed when the pit was opened in 1998, and was the only remaining location where the October 1999 samples indicated that PCBs were present at concentrations greater than 1 mg/kg (7.0 mg/kg and 6.6 mg/kg). After removing this additional soil, PCBs were detected at a concentration of 2.2 mg/kg in a sample collected from the back of the excavated area. The area of this sample was also excavated. In order to evaluate the final extent of the contamination, soil samples were collected at 2 and 4 feet below the floor surface from boring SB51-MRP3-WW-11D, approximately 2 feet west of SS-51MRP3-00-W11C. No PCBs were detected. The locations of the samples are shown on Figure 11. Concentrations of analytes detected are included in Table 2a.

Test Pit 5

In accordance with Berkeley Lab's December 1999 workplan (Berkeley Lab, 1999c), soil in Test Pit 5 with concentrations of PCBs above 1 mg/kg was removed. The planned excavation area was enlarged near the northwest corner, because a shallow sample (SS-51MRP5-99-W3A) taken from the excavation wall contained 1.9 mg/kg PCBs (Figure13).

Test Pit 4

TPH in the range of hydraulic/motor oil had been detected at a maximum concentration of 28,000 mg/kg (soil boring 51MRP4-SB1-1.2 on Figure 9 and Table 2) in soil borings drilled at the planned location of Test Pit 4. Therefore, in January and February 2000, Test Pit 4 was excavated to a depth of approximately 4 feet below the basement floor. Confirmation samples were collected beneath the floor (SS-51-MRP4-00-F1 through SS-51-MRP4-00-F3) and along the walls (SS-51-MRP4-00-W1 through SS-51-MRP4-00-W3) of the excavation. PCBs (0.028 mg/kg) were detected in only one wall sample. (Figure 17 and Table 2a). TPH in the range of hydraulic/motor oil was detected at maximum concentration of 310 mg/kg. No VOCs were detected.

Treating The Contaminated Drain Line Effluent

The effluent from the discharge sump is treated by a GAC system and discharged to the sanitary sewer under Berkeley Lab's EBMUD discharge permit.

SECTION 4

RATIONALE FOR NFI RECOMMENDATION

4.1 INTRODUCTION

The Building 51 Sanitary Sewer and Drainage System (AOC 9-9) is recommended for No Further Investigation (NFI) status for the following reasons.

- A source for the contamination has been located.
- The magnitude and extent of soil contamination has been evaluated.
- The impact of soil contamination on the groundwater has been evaluated.
- The potential migration of contaminants to surface water and sediment has been evaluated.
- Interim Measures have been implemented to protect human health and the environment.

These criteria were discussed in Section 3 of this report and are summarized below. AOC 9-9 is recommended for NFI status rather than NFA status since PCBs and PAHs were detected in soil at concentrations above PRGs for residential soil.

4.2 RECOMMENDATION FOR NFI STATUS

The Constituents of Potential Concern identified for AOC 9-9 in the December 1999 workplan (Berkeley Lab, 1999c) were VOCs, PAHs, mercury, PCBs, and TPH/oil & grease. Due to the fact that TPH and oil & grease are analytical measures of chemical mixtures containing variable amounts of individual constituents, potential toxic effects for particular levels of TPH or oil & grease cannot be quantified. For this reason, PRGs have not been established for either measure. However, PRGs have been established for specific VOCs and PAHs that are chemical components of TPH and total oil and grease. Therefore, the Chemicals of Potential Concern (COPCs) in this NFI request are VOCs, PAHs, mercury, and PCBs, and do not include either TPH or oil & grease.

The following paragraphs discuss the COPCs and summarize Berkeley Lab's justification for this NFI request:

Source Identification

The source of the contamination was identified as releases from the terra cotta drain line that occurred when contaminated water backed up from the cast iron drain line into the terra cotta drain. The backup of water and subsequent release could occur when the pump in the discharge sump was not operating. The connection between the cast iron drain line and terra cotta drain has been sealed to prevent a future release.

Magnitude and Extent of Contamination

The magnitude and extent of contamination have been evaluated. PCB analysis was conducted on 186 soil samples collected from beneath the Motor Generator Room basement. The following table summarizes the analytical results and concentrations of PCBs remaining in place.

Summary of PCBs Detected in Soil

	PCB Aroclor			
	1242	**1248**	**1254**	**1260**
Number of detections	65	1	2	8
Maximum concentration detected	23 mg/kg	0.94 mg/kg	3.6 mg/kg	1.1 mg/kg
Number of detections above 1 mg/kg	19	0	1	1
Maximum detected concentration remaining in place	1.0 mg/kg	<0.01 mg/kg	0.084 mg/kg	1.1 mg/kg
Number of sample locations where concentrations above 1 mg/kg remain in place	0	0	0	1

Concentrations of PCBs remaining in place are shown on Figure 18 through Figure 21 for various depth ranges. Concentrations of PCBs detected in material that has been excavated are included on the overlays for the figures. The extent of contamination to the west of the Motor Generator Room basement is limited by the western concrete basement wall, which extends to a depth of approximately 4 feet below the basement floor.

Concentrations of PCBs detected above 1 mg/kg remain in place at one sample location:

- 1.1 mg/kg Aroclor 1260 at a depth of 2 feet in SB51-98-2. PCBs were not detected in deeper samples collected in SB51-98-2 (5 and 6.5 feet). The Aroclor-1260 contamination is apparently the result of a thin layer of oil that was applied as a moisture barrier on top of the base rock.

Seventy soil samples were analyzed for PAHs. Benzo(a)pyrene was detected at concentrations slightly above the PRG in only two floor samples from Test Pit 3 (0.074 mg/kg maximum) and one floor sample from Test Pit 5 (0.082 mg/kg) (Table 2a). These samples were collected 7 to 8 feet below the floor. The PRG for residential soil for benzo(a)pyrene is (0.056 mg/kg).

One hundred forty one soil samples collected beneath the Motor Generator Room basement were analyzed for VOCs (Table 2a). VOCs were detected in only 16 of the soil samples, 14 of which were collected from Test Pit 5. All detected concentrations were below PRGs for residential soil.

Mercury analysis was conducted on 123 soil samples collected beneath the Motor Generator Room basement (Table 2b). Mercury (0.82 mg/kg and 0.89 mg/kg) was detected in only two samples. The detected concentrations were above Berkeley Lab background levels but below the PRG for residential soil. Both samples were collected from areas that have been excavated.

<u>Groundwater Contamination</u>

Groundwater contamination has been evaluated and is discussed in Section 3.5. PCBs, oil & grease, crude/waste oil, and VOCs have been detected (Table 4). Based on the April 1999 sampling results, it appears that excavation of PCB contaminated soil from Test Pit 3 has resulted in a marked decrease in PCB concentrations in the groundwater.

Requirements for groundwater monitoring in the basement of the Motor Generator Room will be assessed. At least one of the temporary groundwater sampling points downgradient from Test Pit 3 will be converted to a permanent groundwater monitoring well.

Potential Migration to Surface Water and Sediment

Potential migration to surface water and sediment has been evaluated and was discussed in Section 3.6. Neither PCBs nor PAHs have been detected in surface water or sediment samples collected from North Fork Strawberry Creek (Table 5a and Table 6a). Mercury, which was detected in one sediment sample, was within Berkeley Lab soil background levels. The potential impact to the environment from contaminants detected in surface and sediment will be evaluated in the ecological risk assessment.

Interim Measures

Interim Measures have been conducted in the basement to reduce the potential impact of contaminants to groundwater and to protect human health and the environment. The contaminated sediment and sludge were removed from the filter and discharge sumps. The sumps and the cast iron drain line were cleaned. A subsequent video survey of the pipe indicated no remaining oil contamination. The effluent from the discharge sump is treated by a GAC system and discharged to the sanitary sewer.

Approximately 70-cubic yards of contaminated soil and backfill were excavated. The objective of the IMs were to remove contaminated soil with concentrations of PCBs above the USEPA self-implementing cleanup level (i.e., the "walk away" level) of 1 mg/kg for soil in high occupancy (residential) areas and soil with concentrations of other COPCs above PRGs. This was accomplished except for one limited location where detected concentrations of PCBs remaining in place are slightly above 1 mg/kg and three locations where benzo(a)pyrene was detected at concentrations just above the PRG for residential soil.

The IM cleanup levels were conservative, since the remediated contaminants were only present in soil and backfill below an 8-inch-thick concrete floor in the basement of a laboratory building.

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LIST OF FIGURES

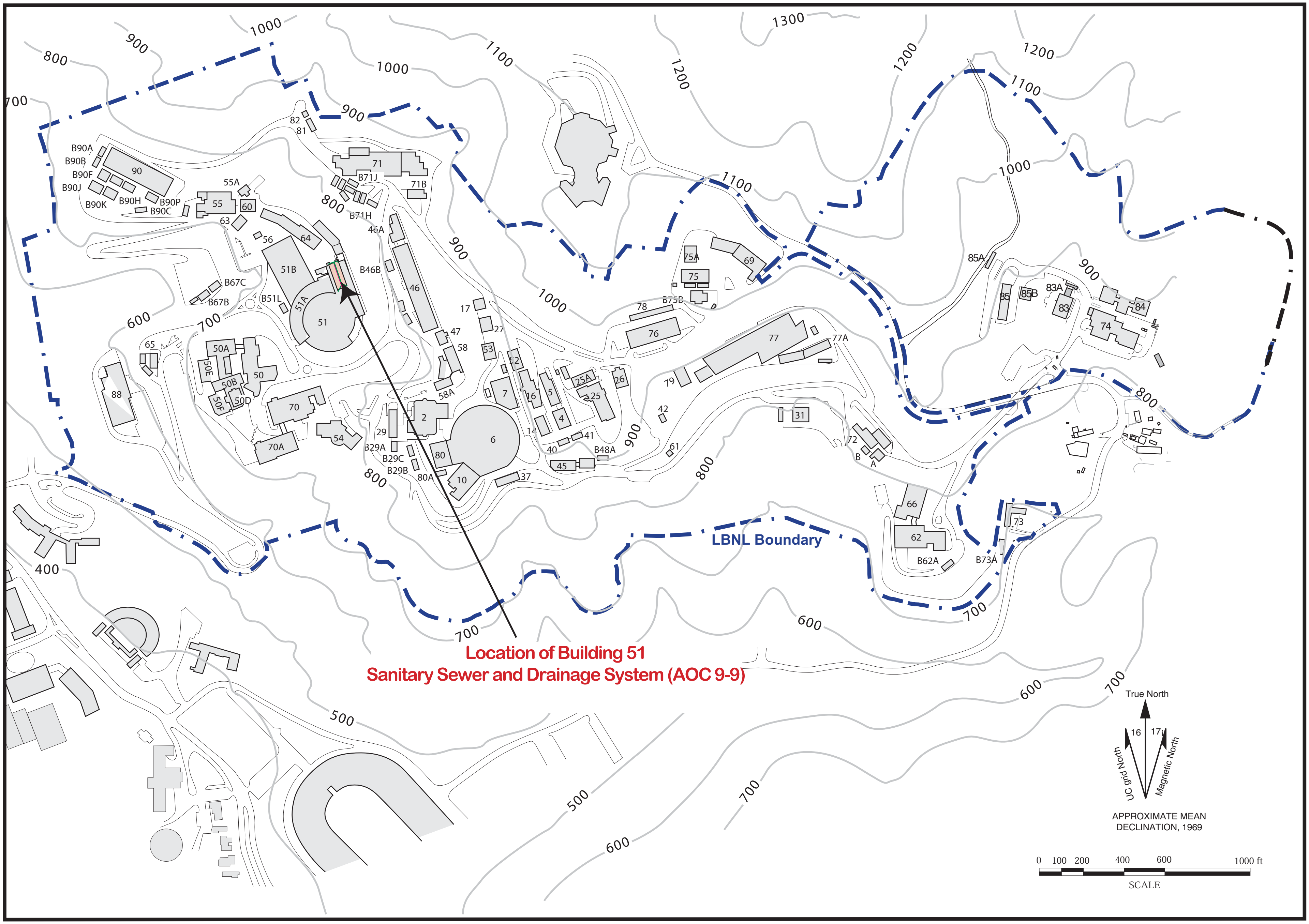

Figure 1. **Location Map, Site of Building 51 Sanitary Sewer and Drainage System in Motor Generator Room Basement (AOC 9-9), Lawrence Berkeley National Laboratory.**

1-LocMap.ai
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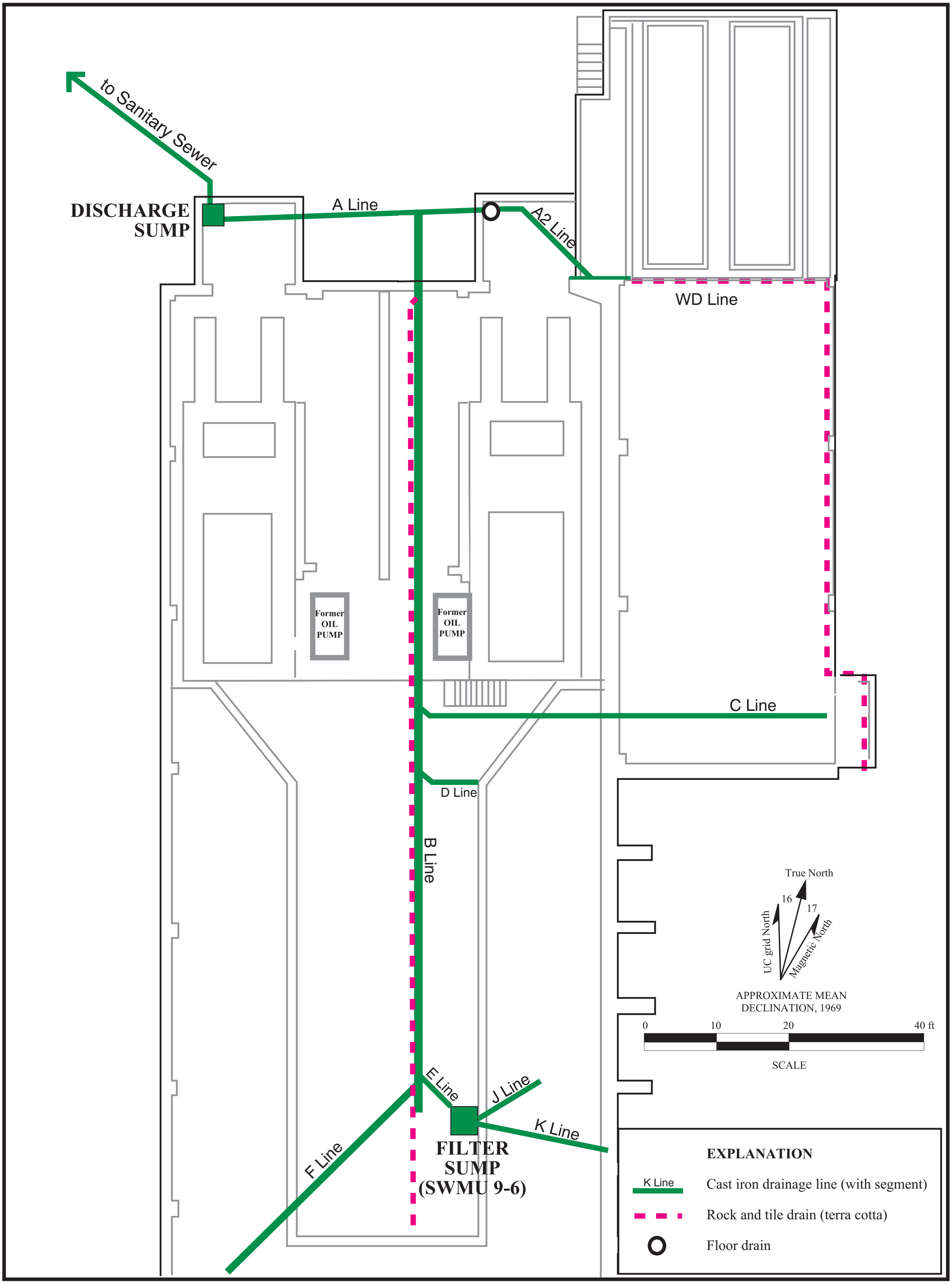
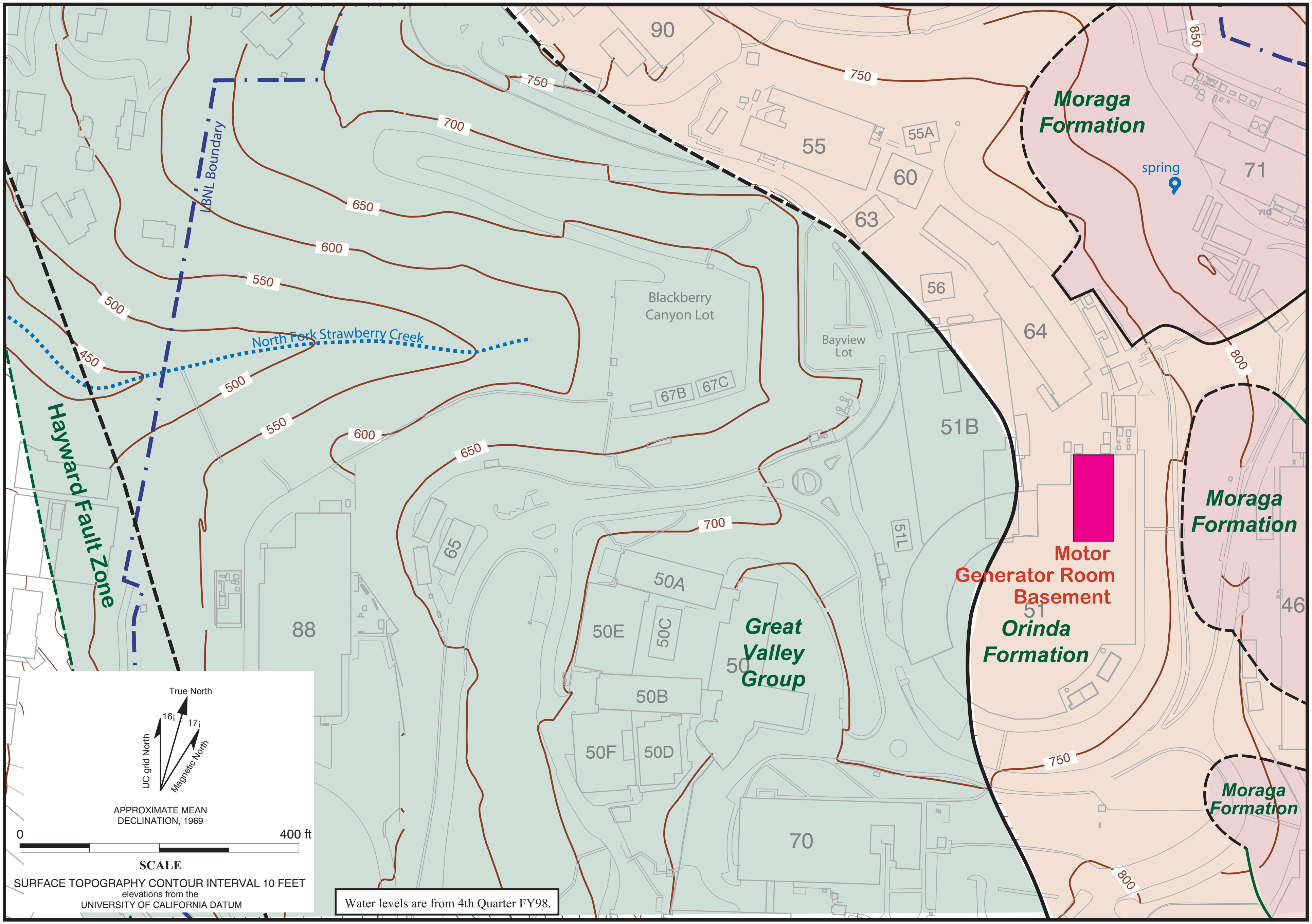


2-PlanView.ai
03/00

Figure 2. Plan View of Building 51 Motor Generator Room Basement Showing Location of Drainage Lines.



3A-B51WL-GeoMap.ai
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Figure 3. Bedrock Geology Map, Building 51/64 Area.

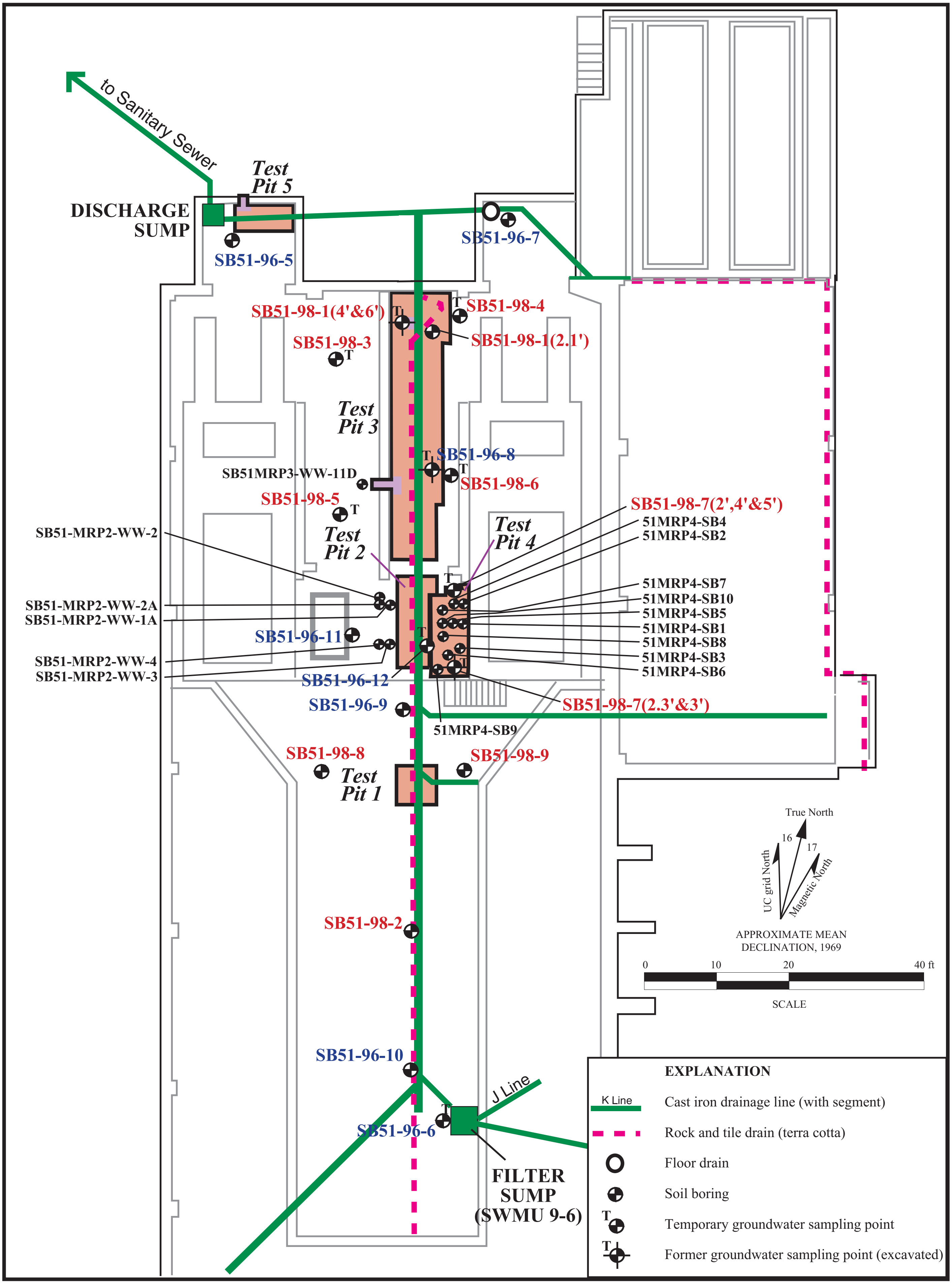

Figure 4. Plan View of Building 51 Motor Generator Room Basement with Locations of Soil Borings and Test Pits.

4-Borings&Pits.ai
03/00

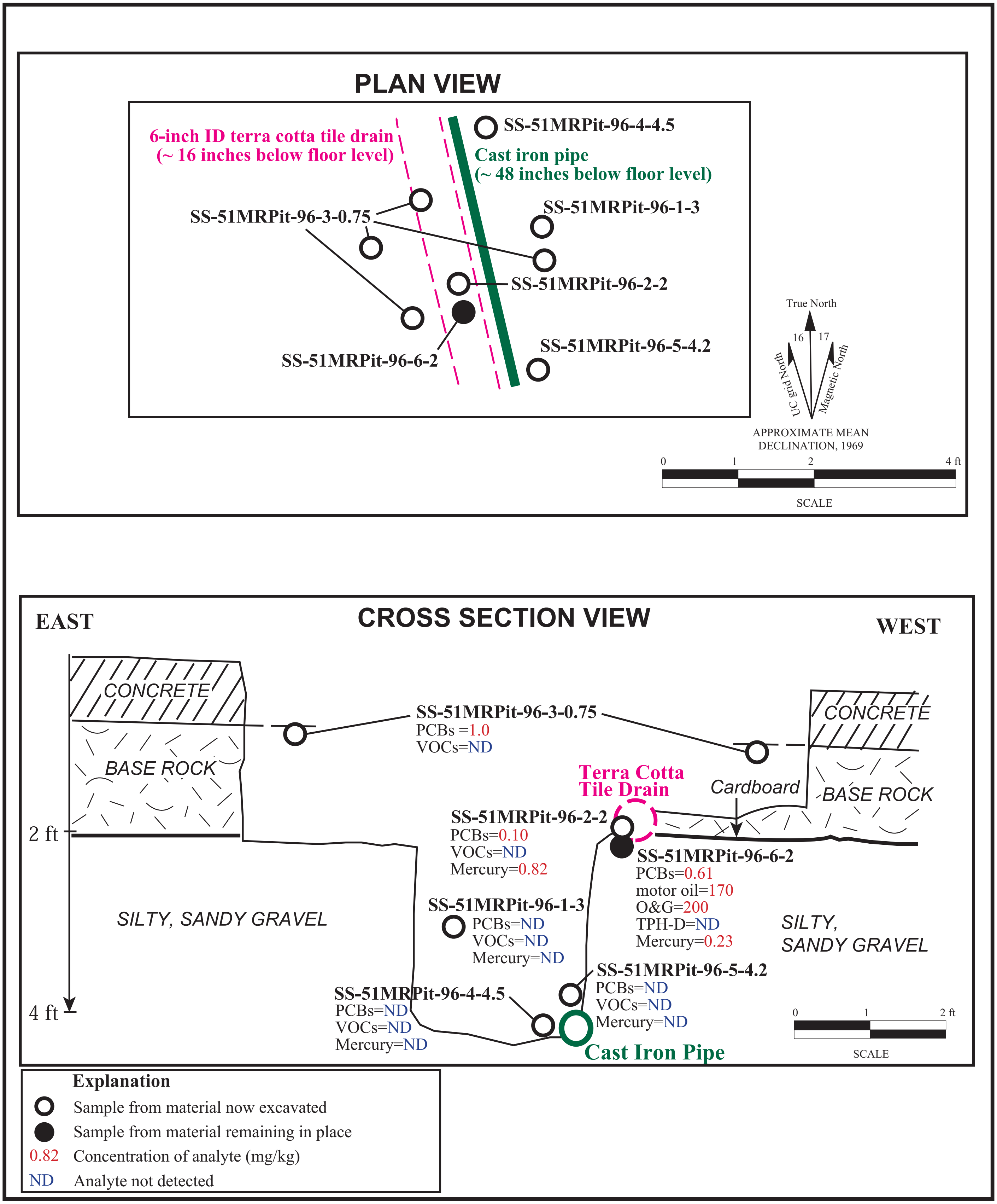

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Figure 5. Map and Cross Section of Test Pit 1 Showing Locations of Soil Samples and Concentrations of Analytes Detected (mg/kg).

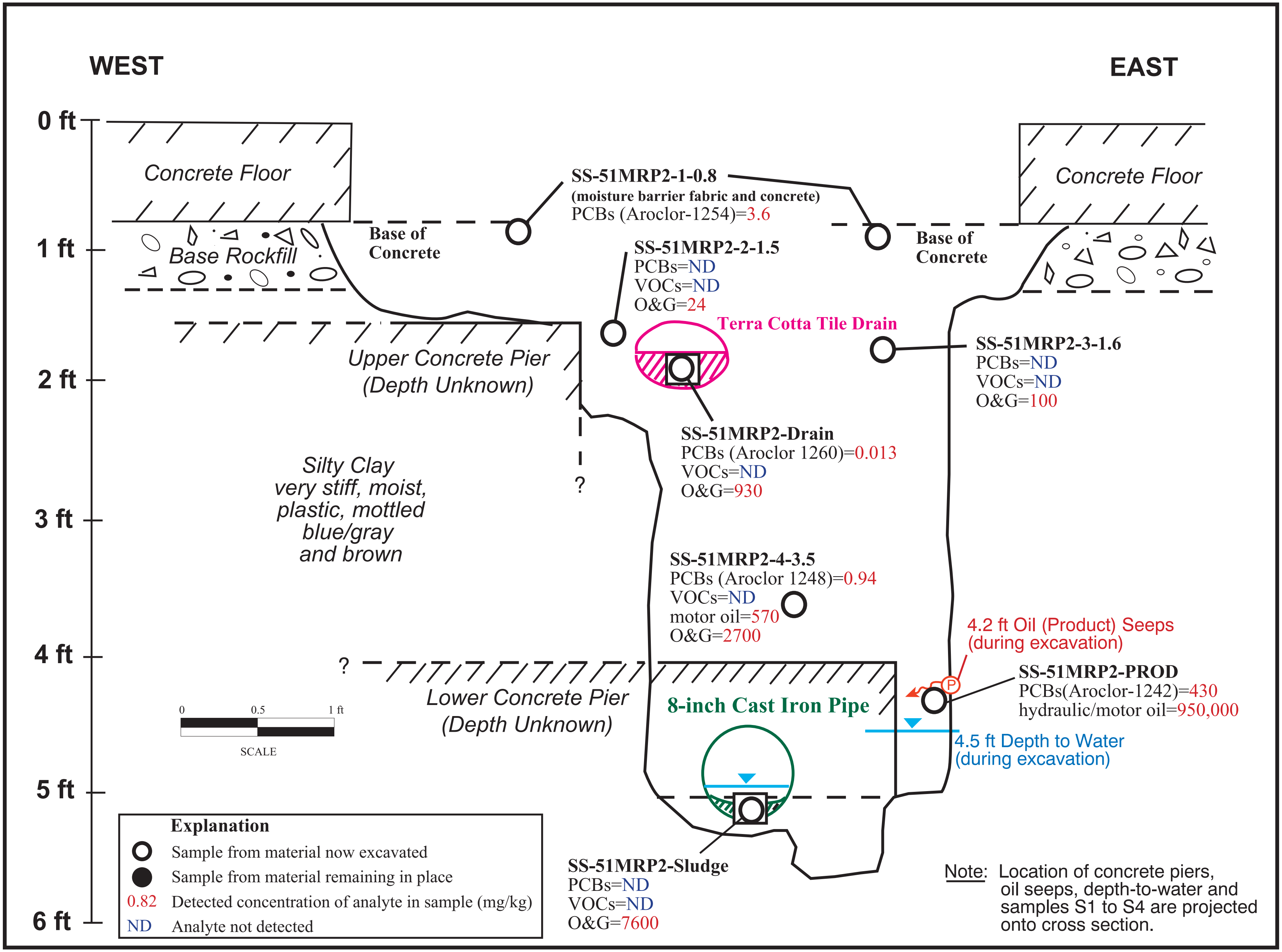

Figure 6. **Cross-Section Through Test Pit 2 Showing Locations of Samples and Concentrations of Analytes Detected (mg/kg).**

6-Pit2.ai
03/00

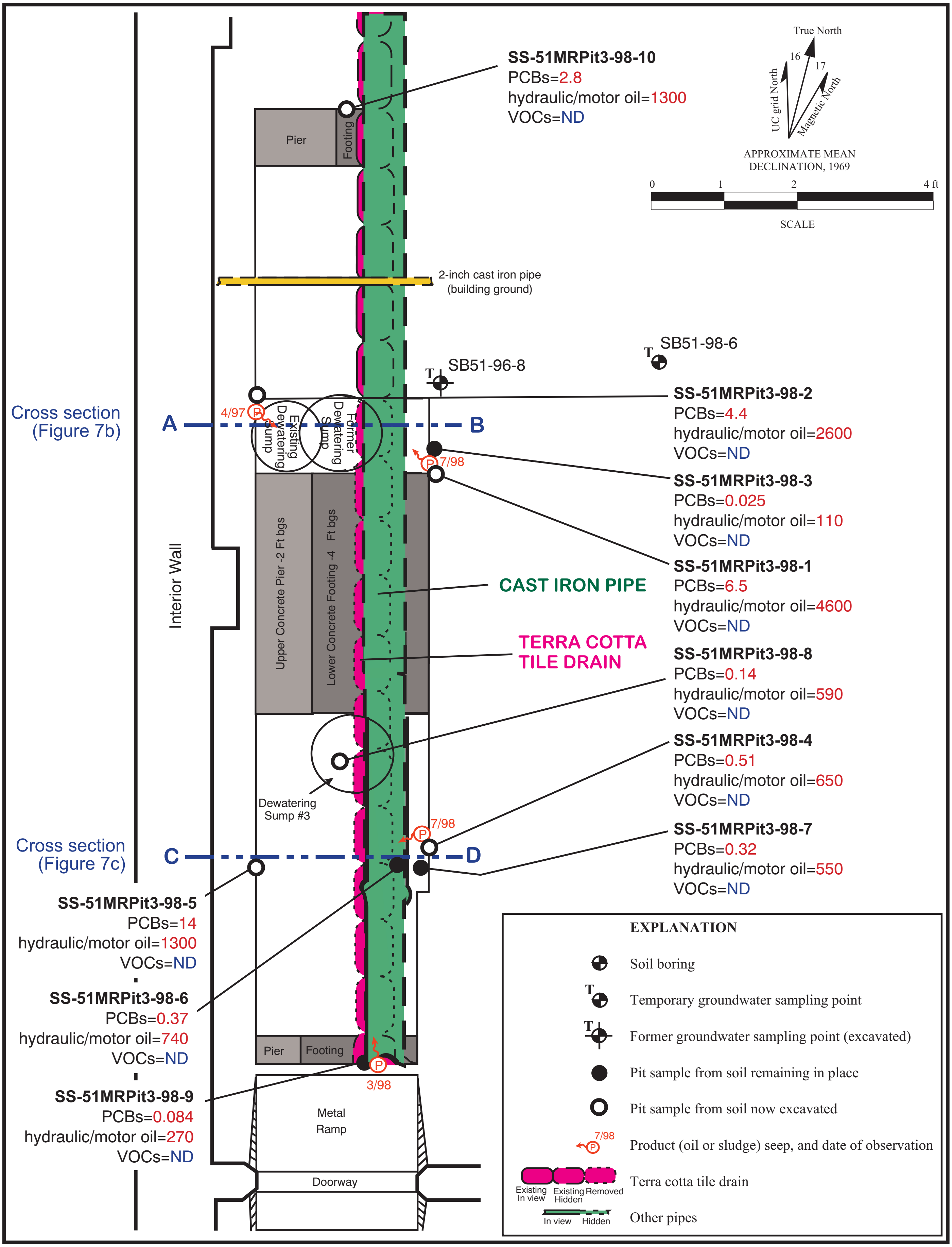

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Figure 7a. Map of Test Pit 3 (July 1998) Showing Locations of Soil Samples and Concentrations of Analytes Detected (mg/kg).

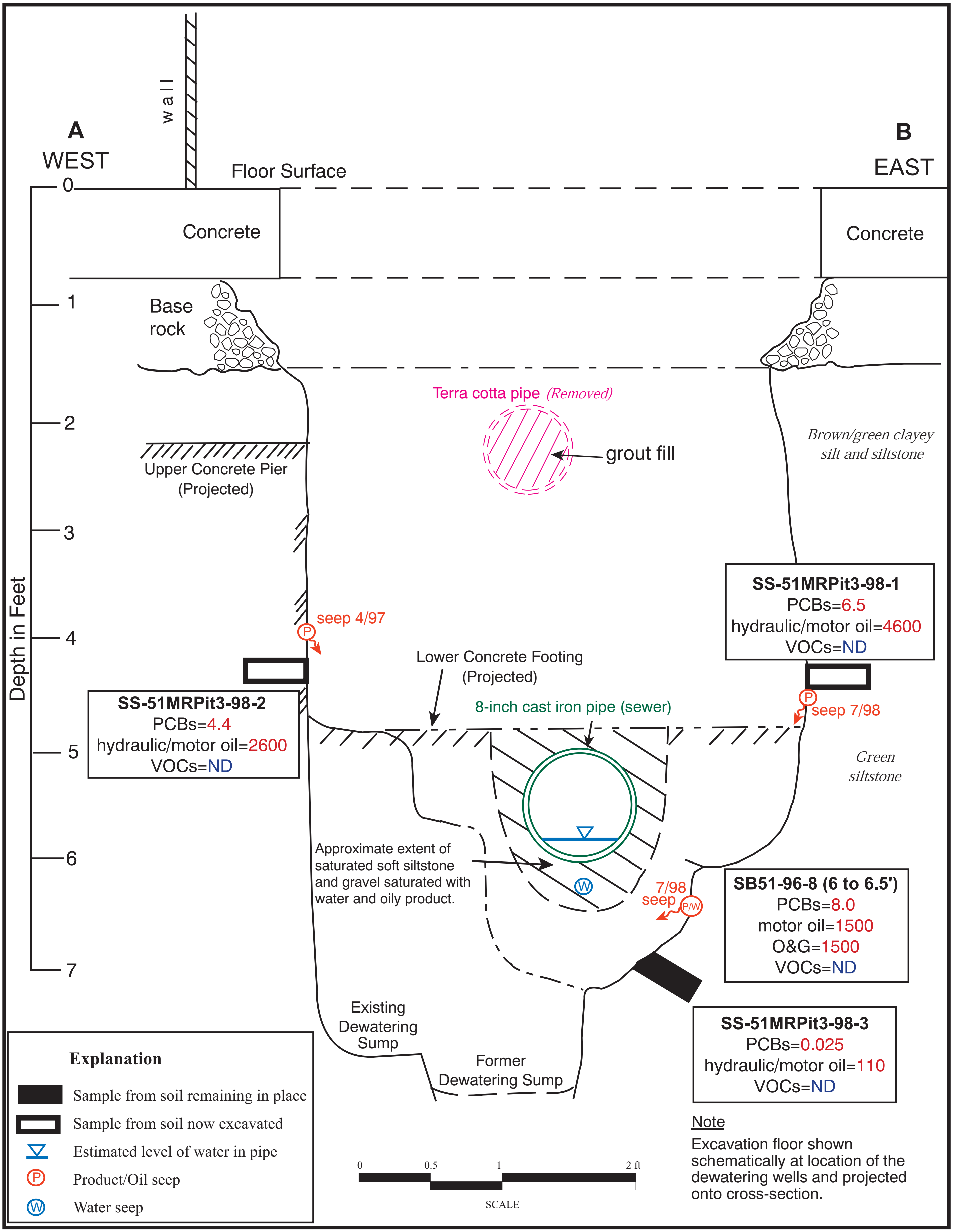

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Figure 7b. **Cross-Section A-B (Test Pit 3 July 1998) Showing Locations of Soil Samples and Concentrations of Analytes Detected (mg/kg).**

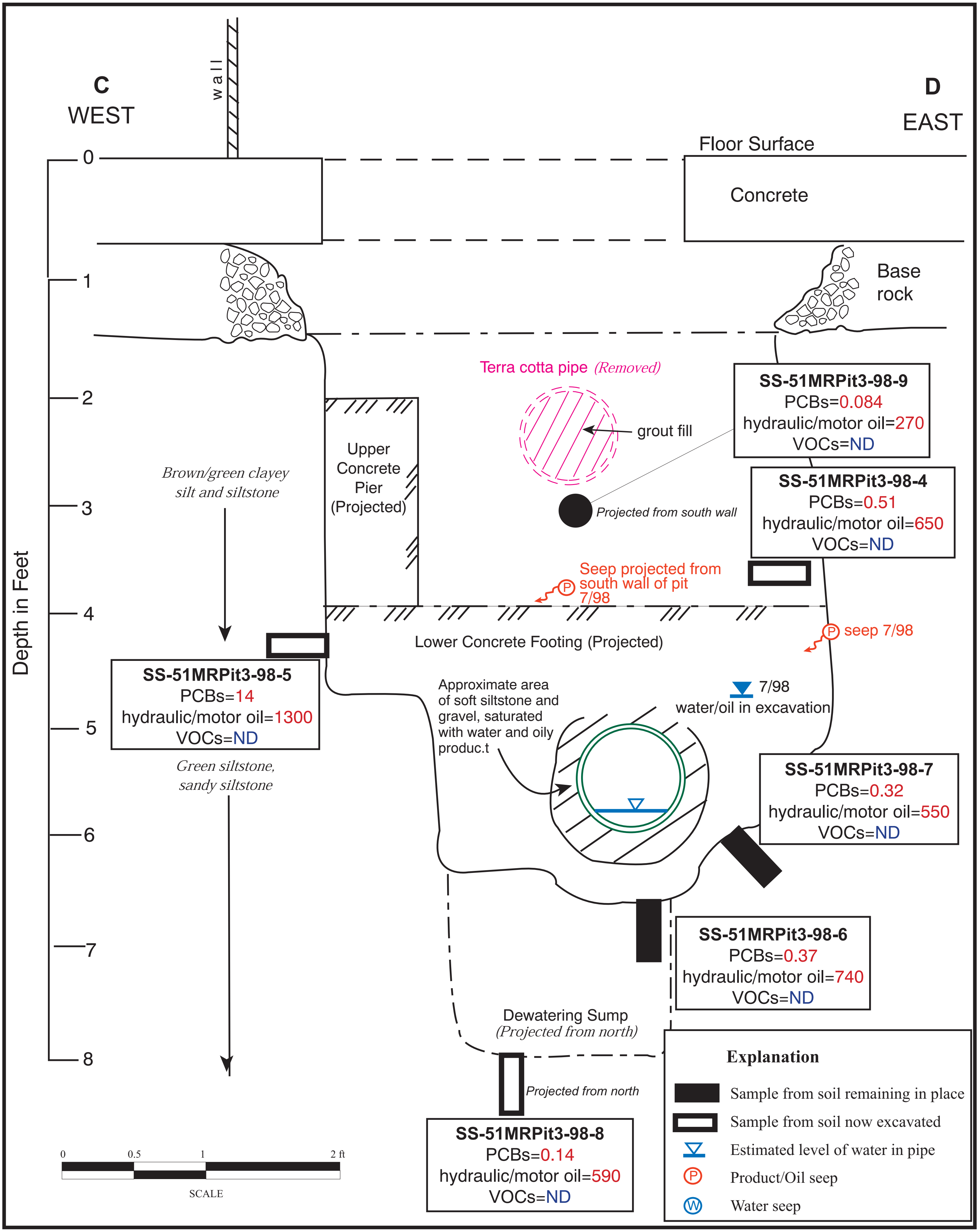

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Figure 7c. **Cross-Section C-D (Test Pit 3 july 1998) Showing Locations of Soil Samples and Concentrations of Analytes Detected (mg/kg).**

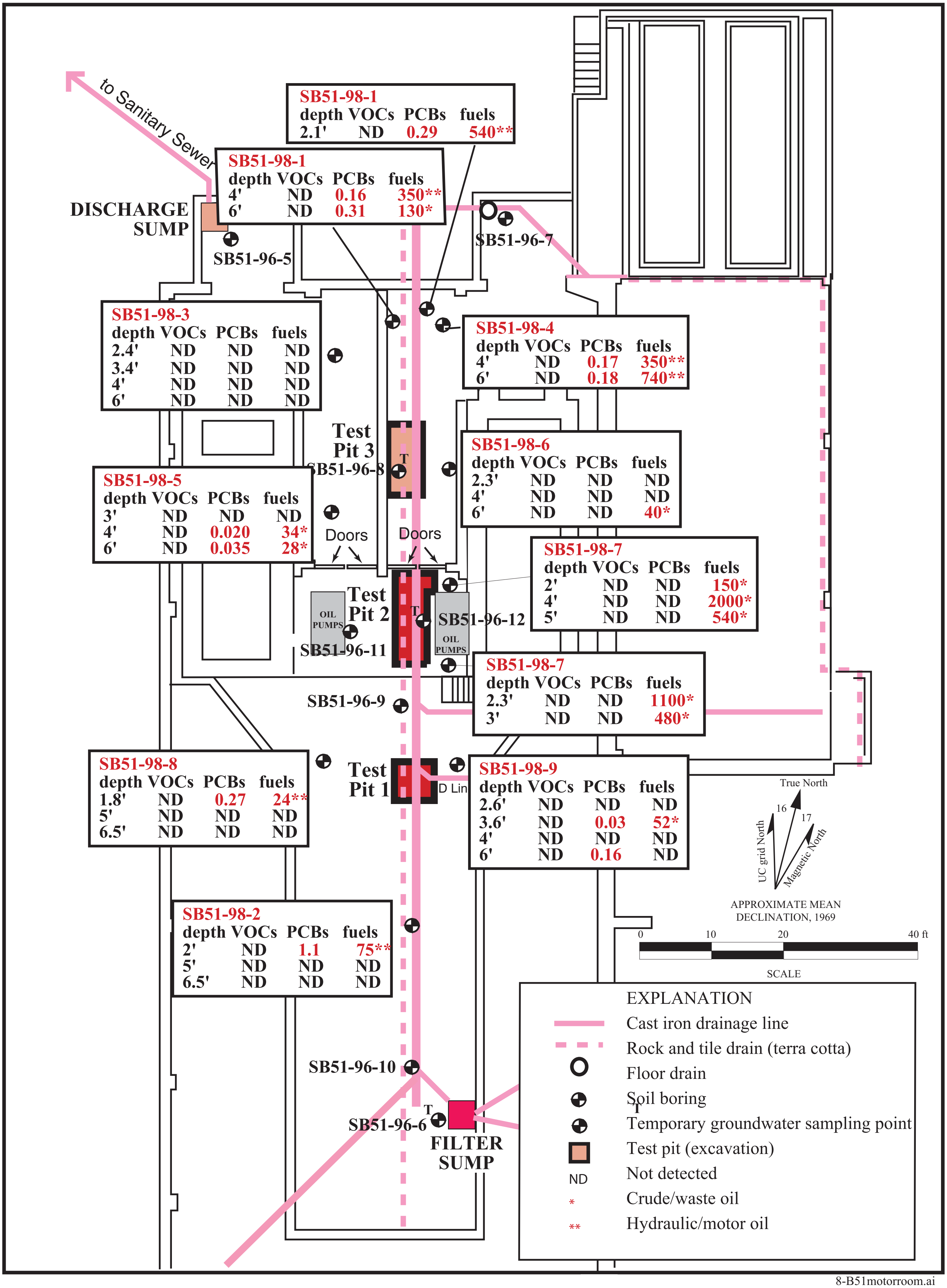

Figure 8. Locations of Soil Borings SB51-98-1 through SB51-98-9 and Concentrations of Contaminants Detected (mg/kg), Building 51 Motor Generator Room

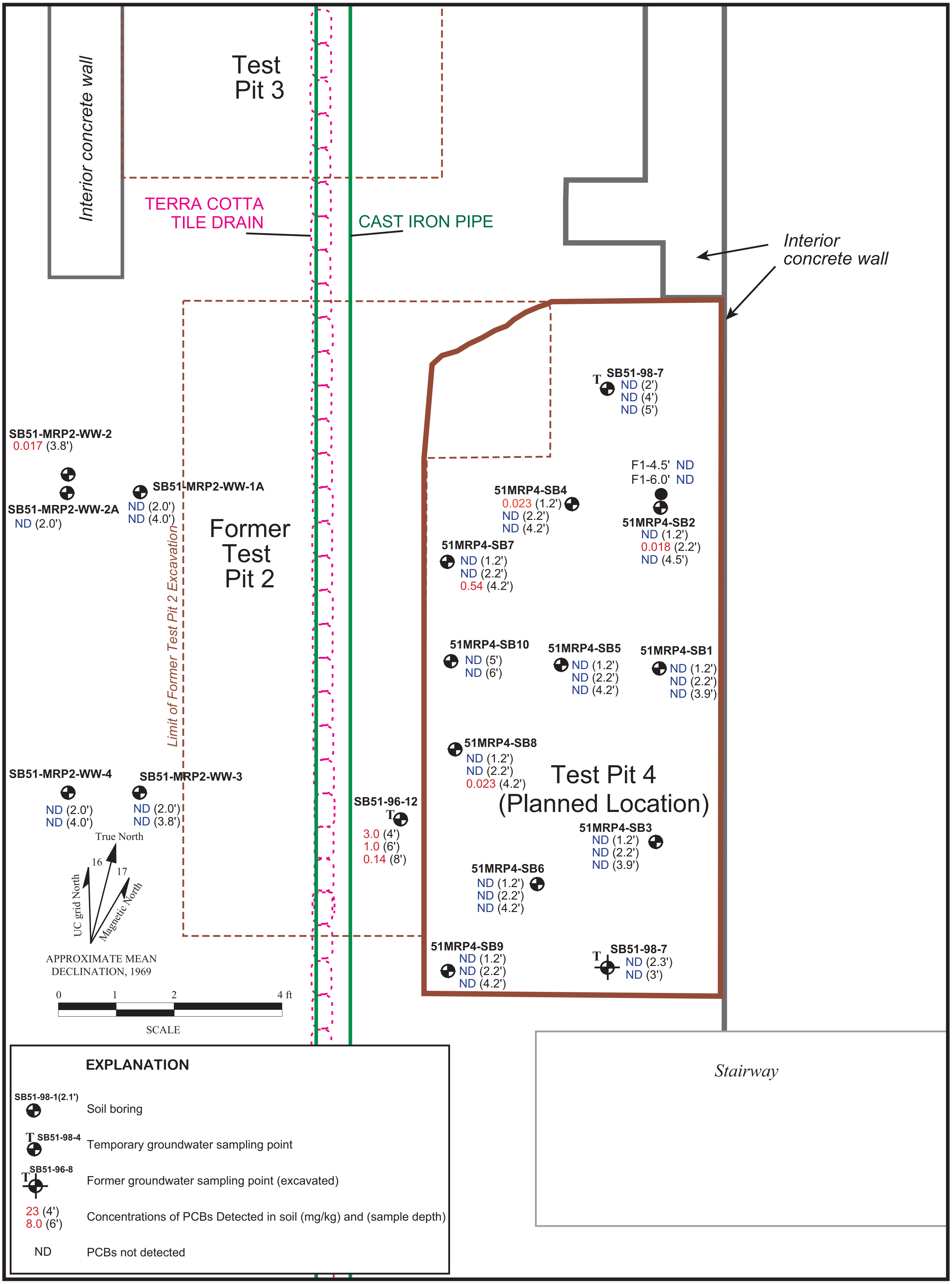

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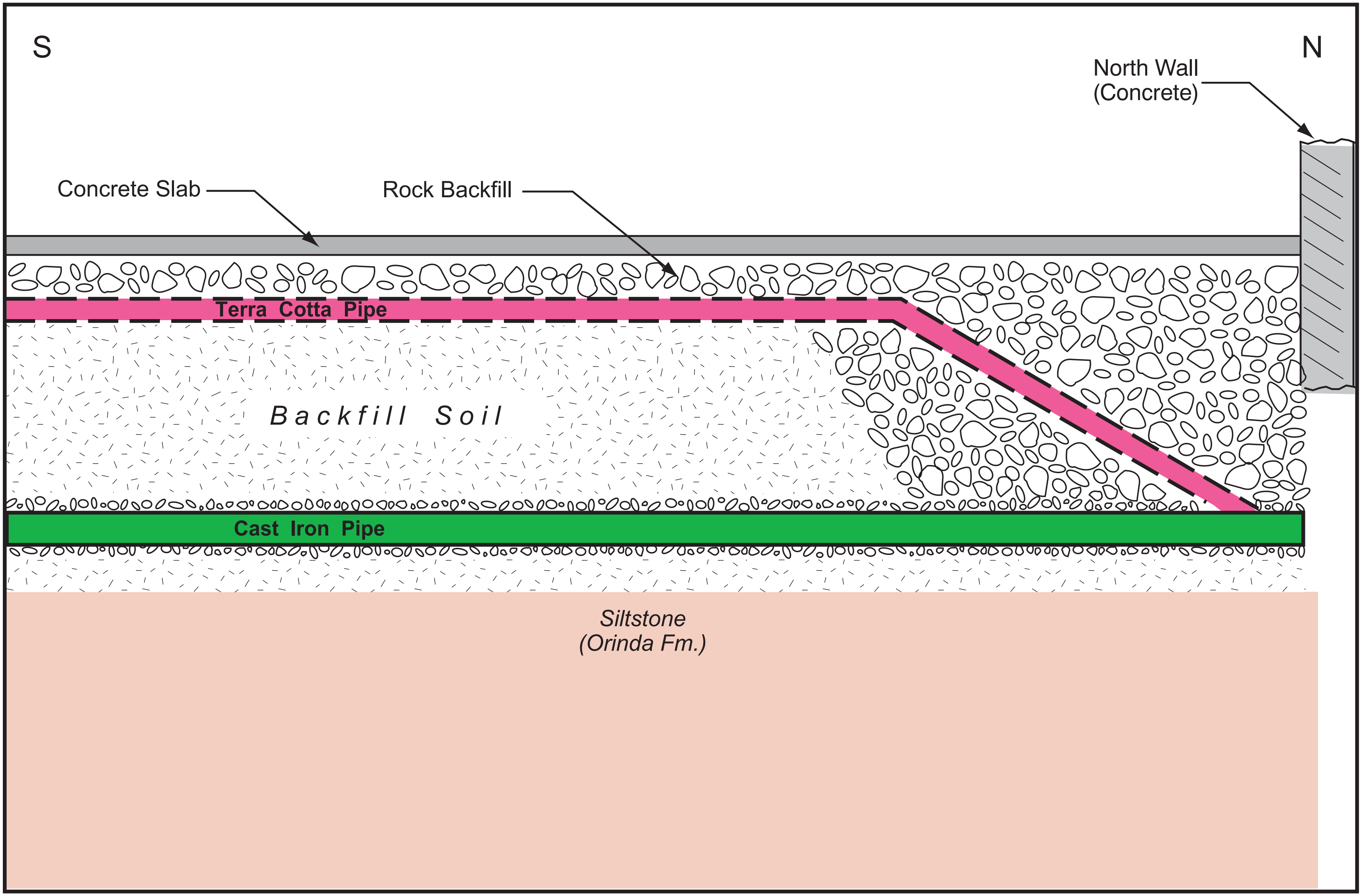
Figure 9. Plan View of Proposed Test Pit 4 Showing Concentrations of PCBs Detected (mg/kg) in Soil Borings.



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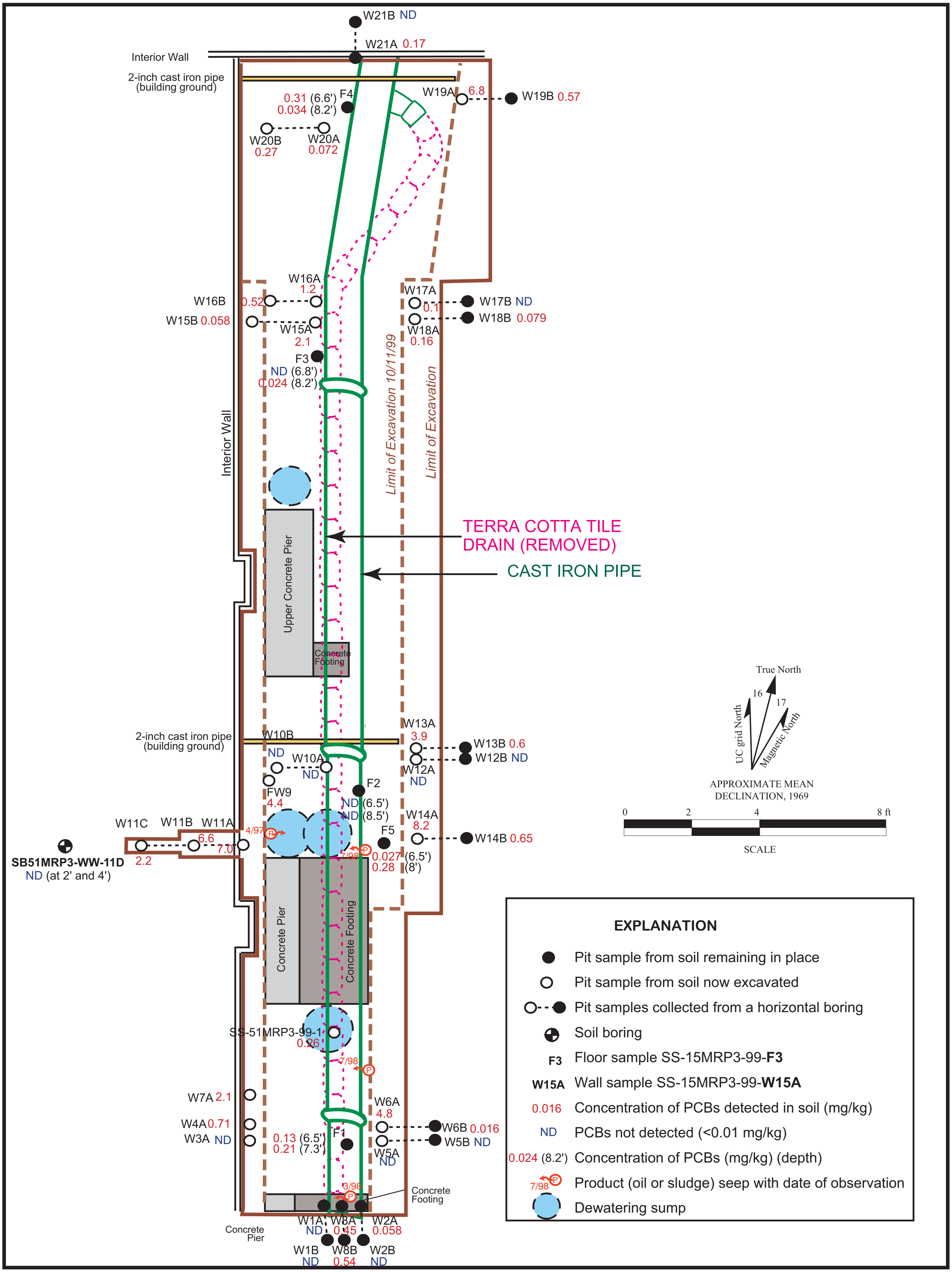
03/00

Figure 10. Diagrammatic View of Connection of Cast Iron Pipe and Terra Cotta Tile Drain at North End of test Pit 3 .



11-Pit3resultsPCBsPlan.ai
4/00

Figure 11. Concentrations of PCBs Detected (mg/kg) in 1999 and 2000 Samples, Test Pit 3 (Plan View).

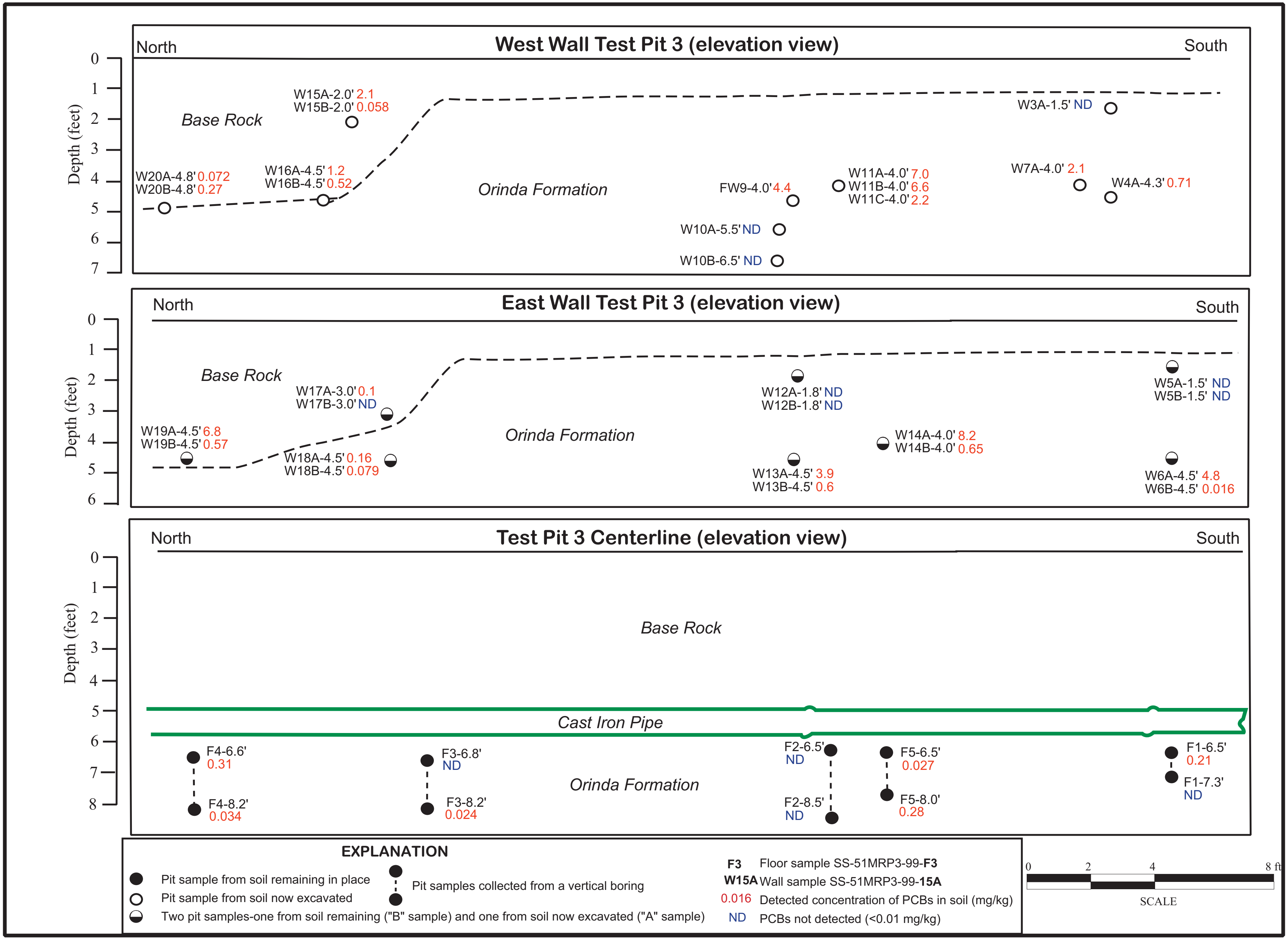


Figure 12. Concentrations of PCBs Detected in Soil Samples Collected in October 1999 (mg/kg), Test Pit 3.

12i-Pit3wallPCBs.ai
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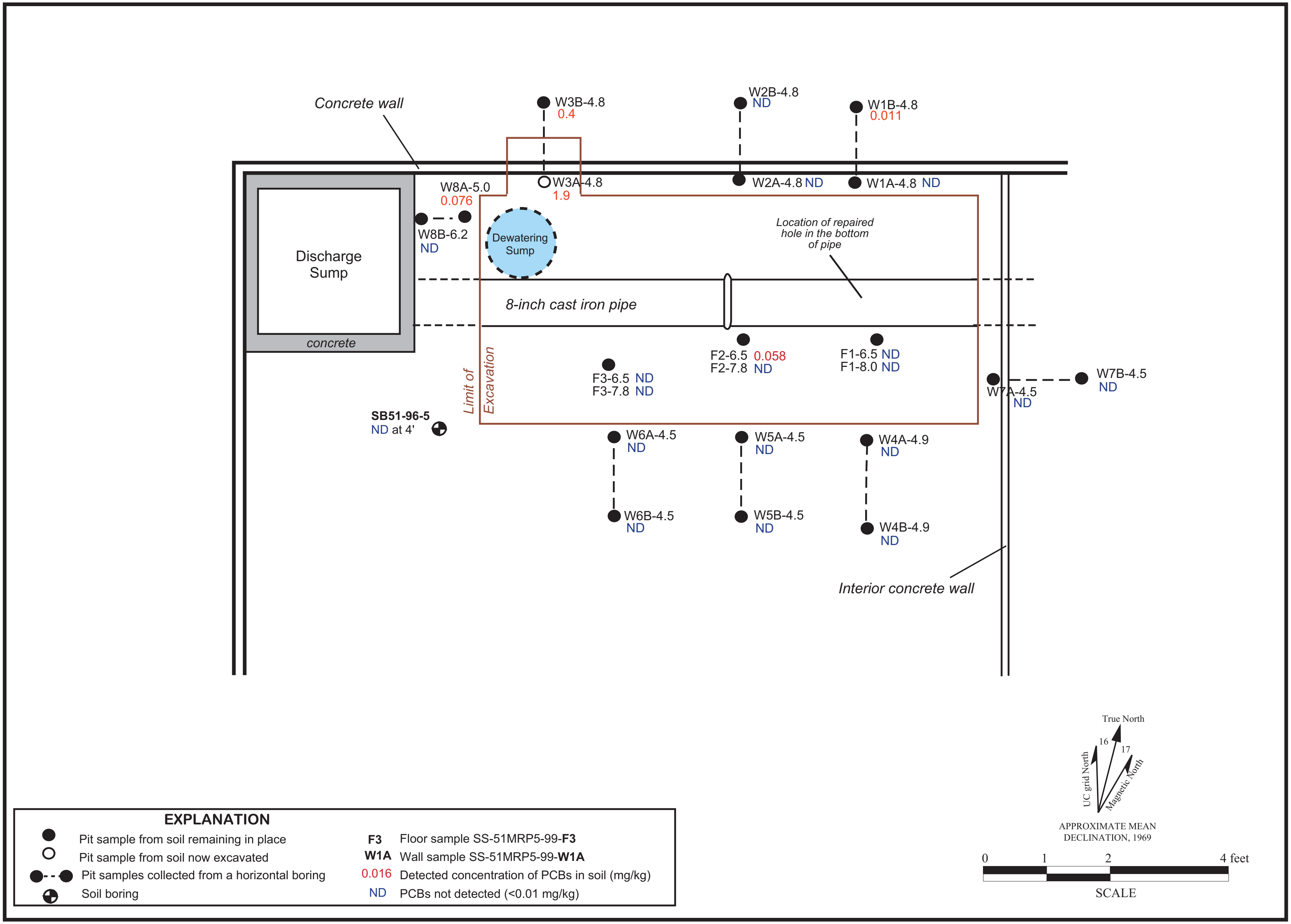

Figure 13. Plan View of Test Pit 5 With Concentrations of PCBs Detected (mg/kg) in Soil Samples.

13-Pit5PCBsPlan.ai
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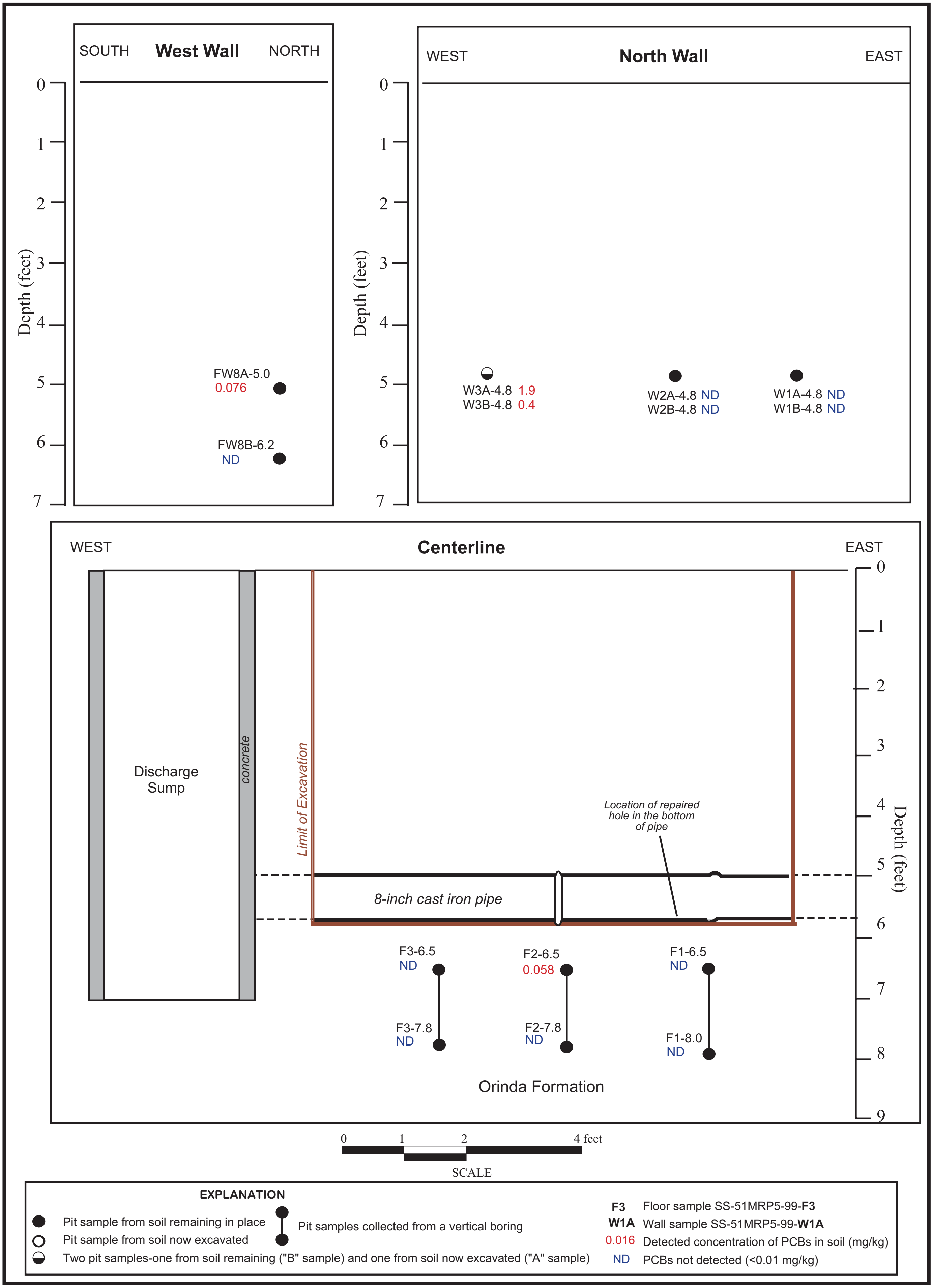

Figure 14. Elevation Views of Test Pit 5 With Concentrations of PCBs Detected (mg/kg).

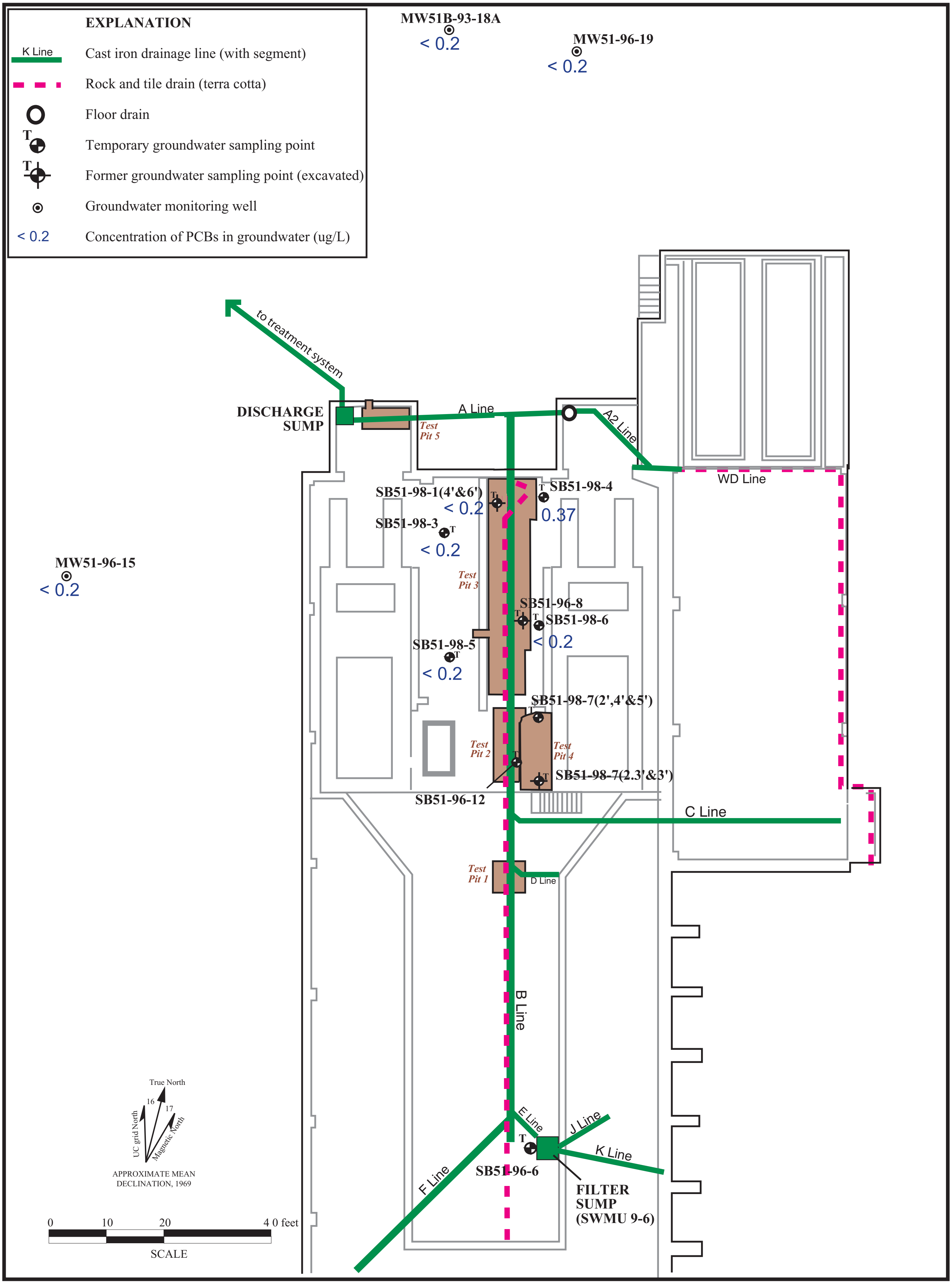

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Figure 15. Results of PCBs in Groundwater (ug/L) in the Area of the Building 51 Motor Generator Room Basement - April 1999.

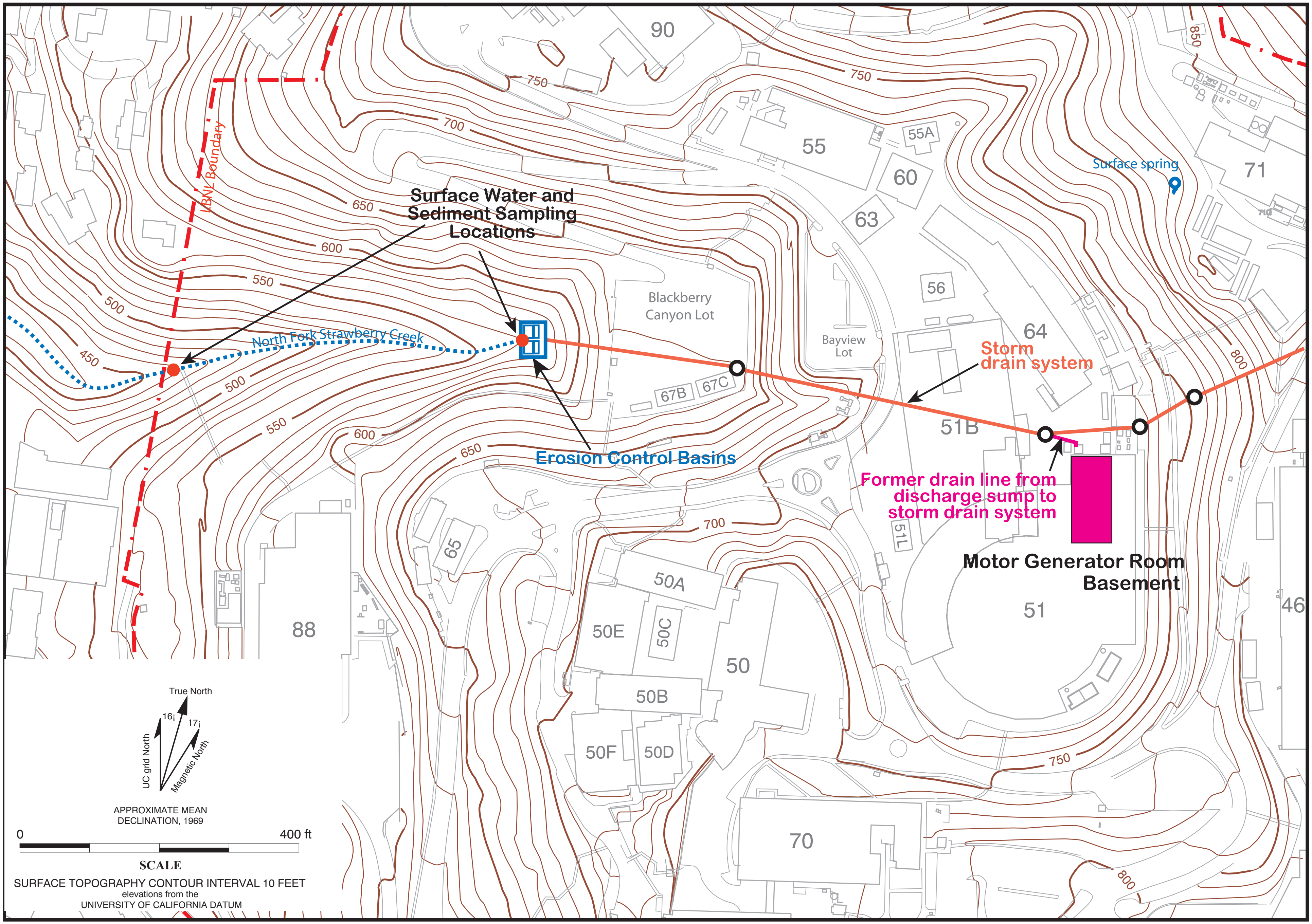

Figure 16. Potential Migration Pathway for Contamination to Surface Water from Building 51 Drainage System (AOC 9-9) and Surface Water and Sediment Sampling Locations.

16-B51SurfWtr.ai
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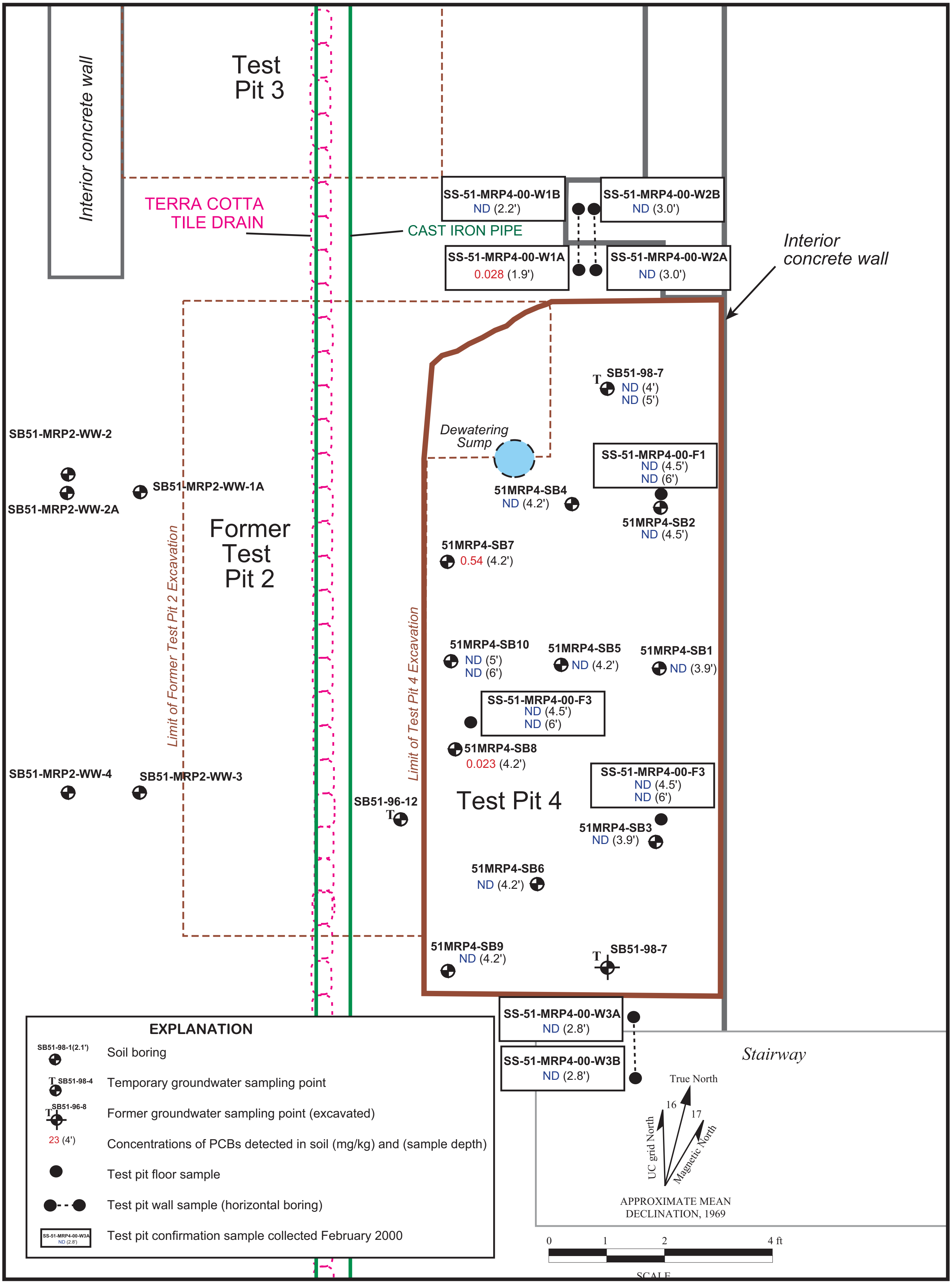

17-Pit4PCBsPlan.ai
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Figure 17. Plan View of Test Pit 4 Showing Concentrations of PCBs Detected in Confirmation Samples (mg/kg)

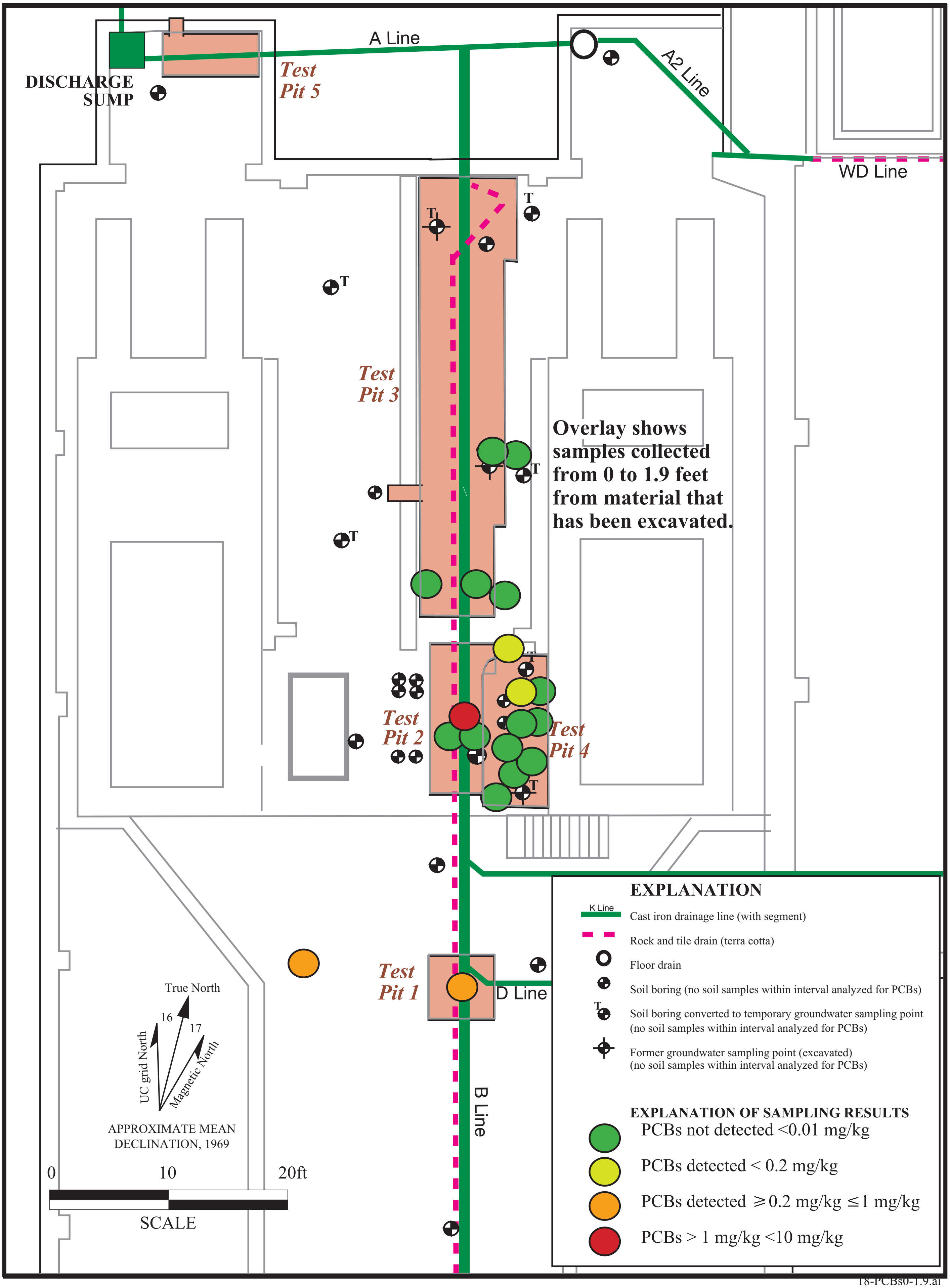


Figure 18. PCBs Remaining in Soil at Depths of 0 to 1.9 Feet Below Motor Generator Room Basement Floor, Building 51 Sanitary Sewer and Drainage System (AOC 9-9).

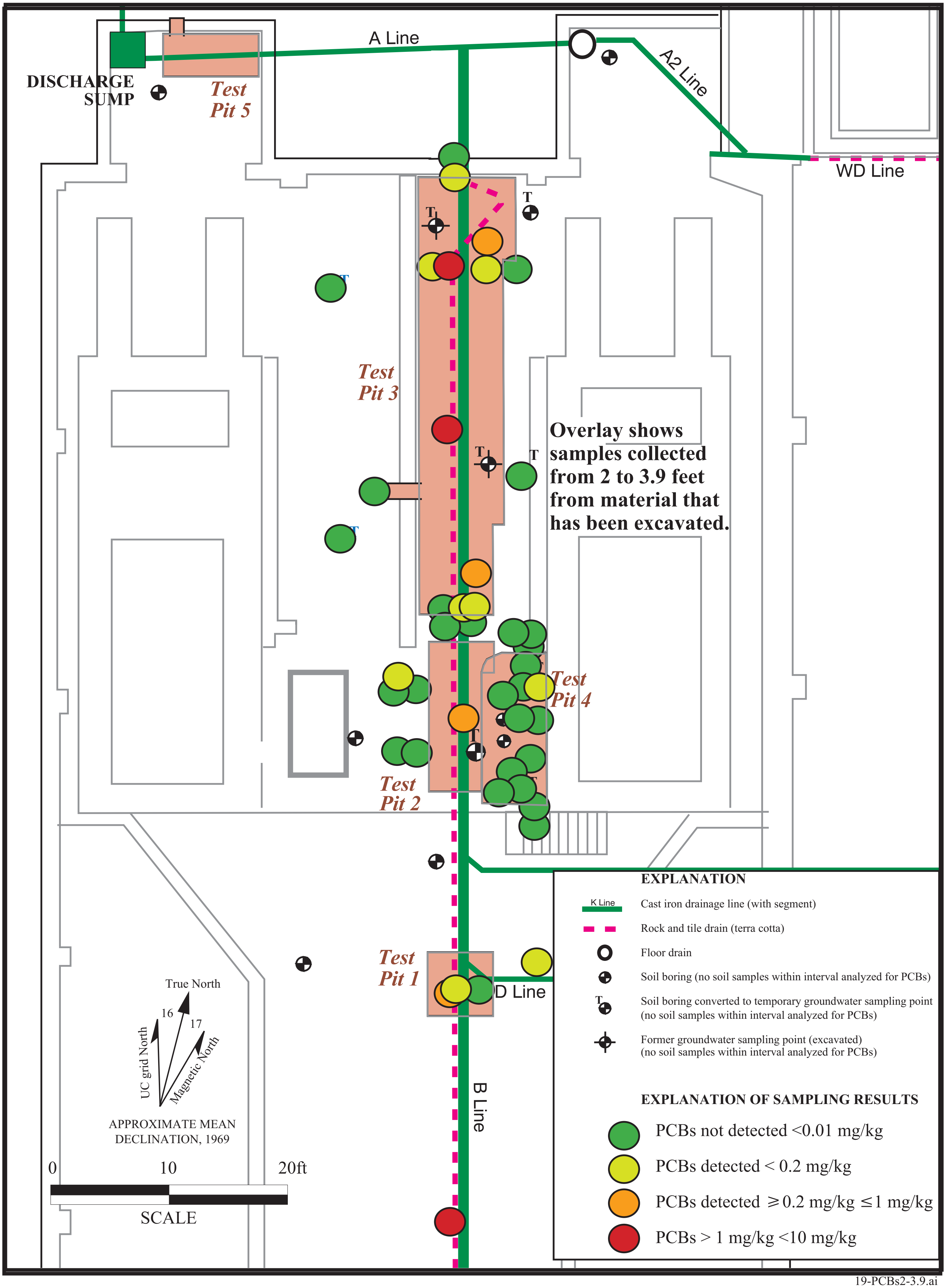
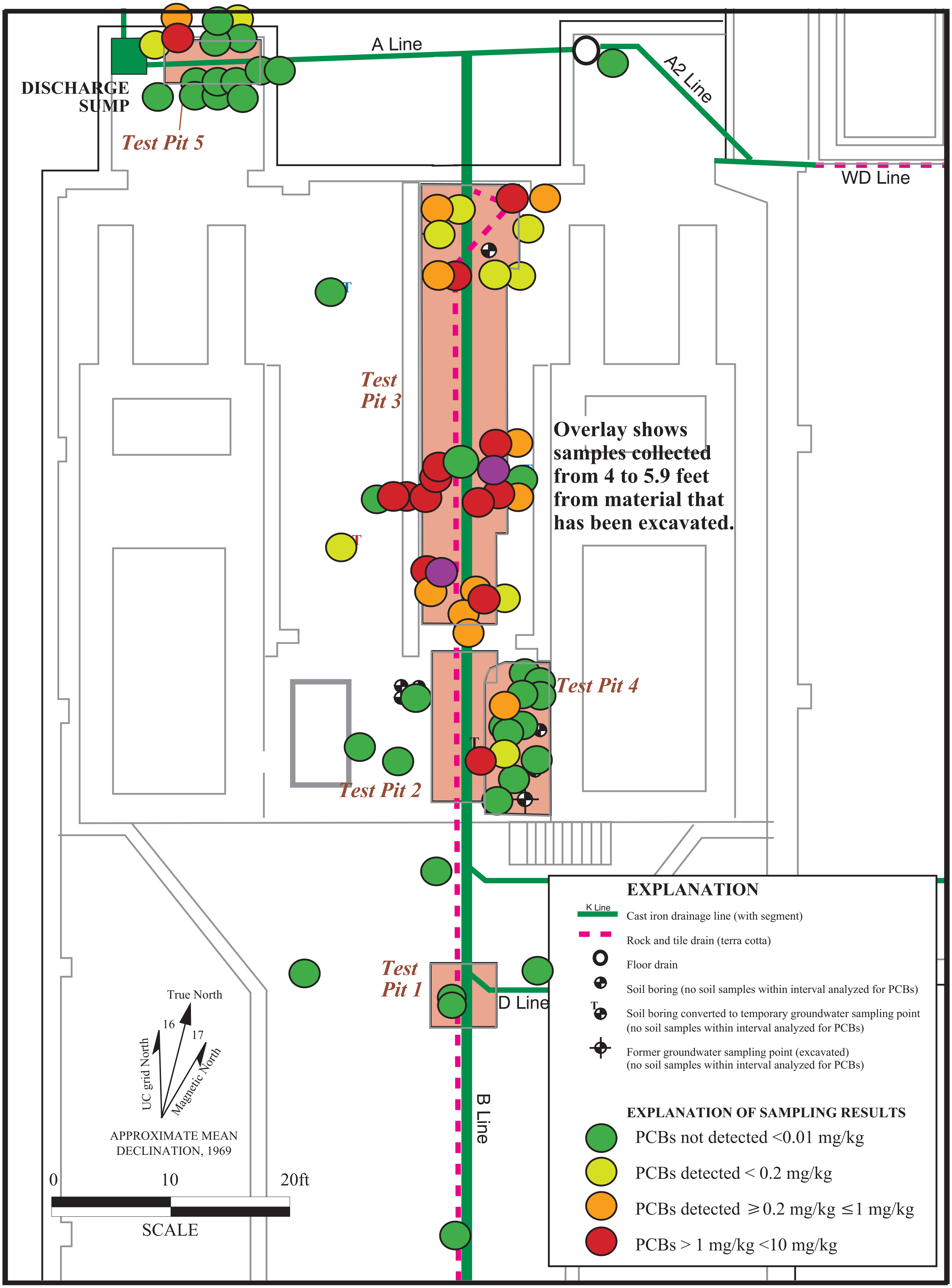


Figure 19. PCBs Remaining in Soil at Depths of 2 to 3.9 Feet Below Motor Generator Room Basement Floor, Building 51 Sanitary Sewer and Drainage System (AOC 9-9).



20-PCBs4-5.9.ai
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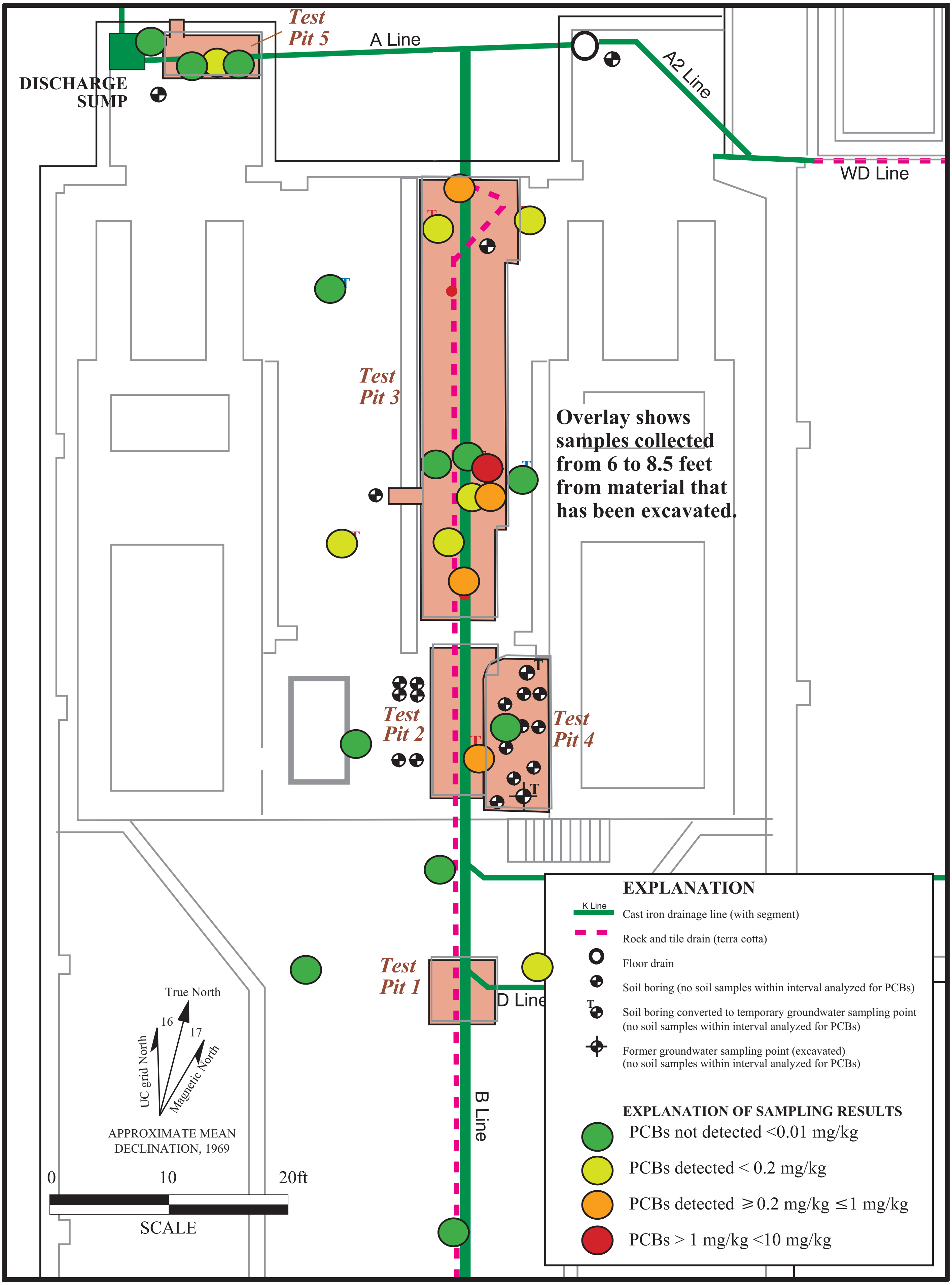
Figure 20. **PCBs Remaining in Soil at Depths of 4 to 5.9 Feet Below Motor Generator Room Basement Floor, Building 51 Sanitary Sewer and Drainage System (AOC 9-9).**



21PCBs6-8.5.ai
03/00

Figure 21. PCBs Remaining in Soil at Depths of 6 to 8.5 Feet Below Motor Generator Room Basement Floor, Building 51 Sanitary Sewer and Drainage System (AOC 9-9).

LIST OF TABLES

Table 1a.

Drainline and Sump Sampling Results for Organics
AOC 9-9: Building 51 Sanitary Sewer and Drainage System

Sludge/Sediment (concentrations in mg/kg)

Boring/Sample ID	Analyte / Date Sampled	VOCs 8260	SVOCs 8270	PCBs 8080 or 8082	Fuels 8015M	TPH-D 8015M	Oil & Grease 413.1
Test Pit 2							
SS-51MRP2-Drain	Mar-96	ND		Aroclor 1260=0.013			930
SS-51MRP2-Sludge	Mar-96	ND		<3			7600
Discharge Sump Sludge Samples							
SS-MR-DS-1 & -2	May-96			Aroclor 1242 = 4.8 Aroclor 1254=0.53		<300	11,000
SS-51DS-99-1	May-99		ND	Aroclor 1242 = 3.5 Aroclor 1260=1.3	Hydraulic/Motor Oil = 18,000		
Filter Sump Sludge Samples							
SS-51MR-FS-1 & 2	May-96			Aroclor 1242 = 380		<400	45,000
SS-51FS-99-1	May-99		Bis(2-ethylhexyl)phthalate=13 Fluoranthene=3.9 Pyrene=3.9	Aroclor 1242 = 330	Hydraulic/Motor Oil = 45,000		

Water (concentrations in µg/L)

Boring/Sample ID	Analyte / Date Sampled	PCBs 8080
Sump Water Samples		
Discharge Sump	Apr-99	Aroclor-1242=4.9
Filter Sump	Apr-99	Aroclor-1242=3,600
K-Line Inflow to Filter Sump	Jun-99	Aroclor-1242=3.4

ND (or < reporting limit) (shaded)	= Not detected
(blank)	= Not analyzed

Sludge and sediment has been removed

Table 1b.
AOC 9-9: Building 51 Sanitary Sewer and Drainage System
Drainline and Sump Sampling Results for Metals
Sludge/Sediment
(Concentrations in mg/kg)

Boring/Sample ID	Date Sampled	Sb	As	Ba	Be	Cd	Cr	CrVI	Co	Cu	Pb	Hg	Mo	Ni	Se	Ag	Tl	V	Zn
Test Pit 2																			
SS-51MRP2-Sludge	Mar-96	*<14*	5.9	118	*<1.5*	6.5	1310	NA	11	2060	382	43	18	37	9.0	5.6	*<14*	46	736
Discharge Sump Sludge Samples																			
SS-MR-DS-1 & -2	May-96	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.1	NA	NA	NA	NA	NA	NA	NA
SS-51DS-99-1	May-99	*<50*	19	656	*<5*	26	1100	NA	37	3680	775	28	*<25*	208	14	*<10*	*<50*	170	2430
SS-51DS-99-1	May-99	*<10*	3.6	131	*<1*	3.5	210	NA	7.5	648	138	3.0	*<5*	40	2.9	*<2*	*<10*	41	472
Filter Sump Sludge Samples																			
SS-51MR-FS-1 & -2	May-96	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	105	NA	NA	NA	NA	NA	NA	NA
SS-51FS-99-1	May-99	*<10*	4.2	85	*<1*	8.7	305	NA	9.3	1600	301	46.0	*<5*	17	2.9	2.6	*<10*	46	369

NA	= Not analyzed
<5	= Not detected (reporting limit shown)

Sludge and sediment has been removed

Table 2a.
Soil Sampling Results for Organics
AOC 9-9: Building 51 Sanitary Sewer and Drainage System
(Concentrations in mg/kg)

Boring/Sample ID	Date Sampled	Excavated*	VOCs	PCBs	Fuels	TPH-D	PAHs	Oil & Grease
			8260	8080 or 8082	8015M	8015M	8310	413.1
Soil Borings								
SB51-96-5-4	Apr-96		ND	<1.0	Motor Oil=44			250
SB51-96-7-4	Apr-96		ND	<1.0	<4.0			<10
SB51-96-8-4	Apr-96	X	ND	**Aroclor 1242=23**	Motor Oil=2300			11,000
SB51-96-8-6	Apr-96	X	ND	**Aroclor 1242=8.0**	Motor Oil=1500			1500
SB51-96-9-4	Apr-96		ND	<0.02	Motor Oil=25			<10
SB51-96-9-6	Apr-96		ND	<0.02	<2.0			<10
SB51-96-11-4	Apr-96		ND	<1.0	<2.0			<10
SB51-96-11-6	Apr-96		ND	<0.02	<2.0			<10
SB51-96-12-4	Apr-96	X	ND	**Aroclor 1242=3.0**	Motor Oil=1000			1400
SB51-96-12-6	Apr-96		ND	**Aroclor 1242=1.0**	Motor Oil=1000			890
SB51-96-12-8	Apr-96		ND	Aroclor 1242=0.14	Motor Oil=390			120
SB51-98-1-2.1	Feb-98	X	ND	Aroclor 1242=**0.29**	Hydraulic/Motor Oil=540			
SB51-98-1-4	Jun-98	X	ND	Aroclor 1242=0.16	Hydraulic/Motor Oil=350			
SB51-98-1-6	Jun-98		ND	Aroclor 1242=0.031	Crude/Waste Oil=130			
SB51-98-2-2.0	Feb-98		ND	**Aroclor 1260=1.1**	Hydraulic/Motor Oil=75			
SB51-98-2-5	Jun-98		ND	<0.01	ND			
SB51-98-2-6.5	Jun-98		ND	<0.01	ND			
SB51-98-3-2.4	Feb-98		ND	<0.01	ND			
SB51-98-3-3.4	Feb-98		ND	<0.01	ND			
SB51-98-3-4	Jun-98		ND	<0.01	ND			
SB51-98-3-6	Jun-98		ND	<0.01	ND			
SB51-98-4-4	Jun-98		ND	Aroclor 1242=0.17	Hydraulic/Motor Oil=350			
SB51-98-4-6	Jun-98		ND	Aroclor 1242=0.18	Hydraulic/Motor Oil=740			
SB51-98-5-3	Feb-98		ND	<0.01	ND			
SB51-98-5-4	Jun-98		ND	Aroclor 1242=0.02	Crude/Waste Oil=34			
SB51-98-5-6	Jun-98		ND	Aroclor 1242=0.035	Crude/Waste Oil=28			
SB51-98-6-2.3	Feb-98		ND	<0.01	ND			
SB51-98-6-4	Jun-98		ND	<0.01	ND			
SB51-98-6-6	Jun-98		ND	<0.01	Crude/Waste Oil=40			
SB51-98-7-2.0	Jun-98	X	ND	<0.01	Crude/Waste Oil=150			
SB51-98-7-2.3	Feb-98	X	ND	<0.01	Crude/Waste Oil=1100			
SB51-98-7-3	Feb-98	X	ND	<0.01	Crude/Waste Oil=480			
SB51-98-7-4	Jun-98		ND	<0.01	Crude/Waste Oil=2000			
SB51-98-7-5	Jun-98		ND	<0.01	Crude/Waste Oil=540			
SB51-98-8-1.8	Feb-98		ND	Aroclor 1260=**0.27**	Hydraulic/Motor Oil=24			
SB51-98-8-5	Jun-98		ND	<0.01	ND			
SB51-98-8-6.5	Jun-98		ND	<0.01	ND			
SB51-98-9-2.6	Feb-98		ND	<0.01	ND			
SB51-98-9-3.6	Feb-98		ND	Aroclor 1260=0.03	Crude/Waste Oil=52			
SB51-98-9-4	Jun-98		ND	<0.01	ND			
SB51-98-9-6	Jun-98		ND	Aroclor 1260=0.16	ND			

Table 2a.
Soil Sampling Results for Organics
AOC 9-9: Building 51 Sanitary Sewer and Drainage System
(Concentrations in mg/kg)

Boring/Sample ID	Date Sampled	Excavated*	VOCs 8260	PCBs 8080 or 8082	Fuels 8015M	TPH-D 8015M	PAHs 8310	Oil & Grease 413.1
SB51-MRP2-WW-1A-2.0	Mar-00			<0.01	ND		ND	
SB51-MRP2-WW-1A-4.0	Mar-00			<0.01	ND		ND	
SB51-MRP2-WW-2-3.8	Feb-00			Aroclor-1242=0.017	ND		ND	
SB51-MRP2-WW-2A-2.0	Mar-00			<0.01	ND		ND	
SB51-MRP2-WW-3-2.0	Feb-00			<0.01	ND		ND	
SB51-MRP2-WW-3-3.8	Feb-00			<0.01	ND		ND	
SB51-MRP2-WW-4-2.0	Feb-00			<0.01	ND		ND	
SB51-MRP2-WW-4-4.0	Feb-00			<0.01	ND		ND	
SB51-MRP3-WW-11D-2.0	Feb-00			<0.01	ND		ND	
SB51-MRP3-WW-11D-4.0	Feb-00			<0.01	ND		ND	
51MRP4-SB1-1.2	Apr-99	X		<0.02	Hydraulic/Motor Oil = 28,000			
51MRP4-SB1-2.2	Apr-99	X		<0.01	Hydraulic/Motor Oil = 13,000			
51MRP4-SB1-3.9	Apr-99			<0.01	Hydraulic/Motor Oil = 20,000			
51MRP4-SB2-1.2	Apr-99	X		<0.01	Hydraulic/Motor Oil = 4,900			
51MRP4-SB2-2.2	Apr-99	X		Aroclor 1260 = 0.018	Hydraulic/Motor Oil = 1,000			
51MRP4-SB2-4.5	Apr-99			<0.01	Hydraulic/Motor Oil = 3,300			
51MRP4-SB3-1.2	Apr-99	X		<0.01	Hydraulic/Motor Oil = 27,000			
51MRP4-SB3-2.2	Apr-99	X		<0.01	Hydraulic/Motor Oil = 9,500			
51MRP4-SB3-3.9	Apr-99			<0.01	Hydraulic/Motor Oil = 4,900			
51MRP4-SB4-1.2	Apr-99	X		Aroclor 1260 = 0.023	Hydraulic/Motor Oil = 3,000			
51MRP4-SB4-2.2	Apr-99	X		<0.01				
51MRP4-SB4-4.2	Apr-99			<0.01				
51MRP4-SB5-1.2	Apr-99	X		<0.10	Hydraulic/Motor Oil = 25,000			
51MRP4-SB5-2.2	Apr-99	X		<0.01				
51MRP4-SB5-4.2	Apr-99			<0.01				
51MRP4-SB6-1.2	Apr-99	X		<0.01	Hydraulic/Motor Oil = 1,100			
51MRP4-SB6-2.2	Apr-99	X		<0.01				
51MRP4-SB6-4.2	Apr-99			<0.01				
51MRP4-SB7-1.2	Apr-99	X		<0.01	Hydraulic/Motor Oil = 1,200			
51MRP4-SB7-2.2	Apr-99	X		<0.01				
51MRP4-SB7-4.2	Apr-99			Aroclor 1242 = **0.54**				
51MRP4-SB8-1.2	Apr-99	X		<0.01	Hydraulic/Motor Oil = 5,200			
51MRP4-SB8-2.2	Apr-99	X		<0.01				
51MRP4-SB8-4.2	Apr-99			Aroclor 1242 = 0.023				
51MRP4-SB9-1.2	Apr-99	X		<0.01	Hydraulic/Motor Oil = 57			
51MRP4-SB9-2.2	Apr-99	X		<0.01				
51MRP4-SB9-4.2	Apr-99			<0.01				
51MRP4-SB10-5.0	Apr-99			<0.01	Diesel = 27			
51MRP4-SB10-6.0	Apr-99			<0.01	Diesel = 32			
Test Pit 1								
SS-51MRPit-96-1-3	Mar-96	X	ND	<0.01				

Table 2a.
Soil Sampling Results for Organics
AOC 9-9: Building 51 Sanitary Sewer and Drainage System
(Concentrations in mg/kg)

Boring/Sample ID	Date Sampled	Excavated*	VOCs 8260	PCBs 8080 or 8082	Fuels 8015M	TPH-D 8015M	PAHs 8310	Oil & Grease 413.1
SS-51MRPit-96-2-2	Mar-96	X	ND	Aroclor-1260=0.10				
SS-51MRPit-96-3-0.75	Mar-96	X		**Aroclor-1260=1.0**				
SS-51MRPit-96-4-4.5	Mar-96	X	ND	<0.01				
SS-51MRPit-96-5-4.2	Mar-96	X	ND	<0.01				
SS-51MRPit-96-6-2	Mar-96			Aroclor 1260=**0.61**	Motor Oil=170	<20		200
Test Pit 2								
SS-51MRP2-1-0.8	Nov-96	X		**Aroclor 1254=3.6**				
SS-51MRP2-2-1.5	Nov-96	X	ND	<0.01				24
SS-51MRP2-3-1.6	Nov-96	X	ND	<0.01				100
SS-51MRP2-4-3.5	Nov-96	X	ND	Aroclor 1248=**0.94**	Motor Oil=570			2700
Test Pit 3								
SS-51MRPit3-98-1-4.0	Jul-98	X	ND	**Aroclor 1242=6.5**	Hydraulic/Motor Oil=4600			
SS-51MRPit3-98-2-4.0	Jul-98	X	ND	**Aroclor 1242=4.4**	Hydraulic/Motor Oil=2600			
SS-51MRPit3-98-3-6.0	Jul-98		ND	Aroclor 1242=0.025	Hydraulic/Motor Oil=110			
SS-51MRPit3-98-4-3.5	Jul-98	X	ND	Aroclor 1242=**0.51**	Hydraulic/Motor Oil=650			
SS-51MRPit3-98-5-4.0	Jul-98	X	ND	**Aroclor 1242=14**	Hydraulic/Motor Oil=1300			
SS-51MRPit3-98-6-6.3	Jul-98		ND	Aroclor 1242=**0.37**	Hydraulic/Motor Oil=740			
SS-51MRPit3-98-7-5.8	Jul-98		ND	Aroclor 1242=**0.32**	Hydraulic/Motor Oil = 550			
SS-51MRPit3-98-8-7.5	Jul-98	X	ND	Aroclor 1242=0.14	Hydraulic/Motor Oil=590			
SS-51MRPit3-98-9-3.0	Jul-98		ND	Aroclor 1254=0.084	Hydraulic/Motor Oil=270			
SS-51MRPit3-98-10-3.0	Jul-98	X	ND	**Aroclor 1242=2.8**	Hydraulic/Motor Oil=1300			
SS-51MRP3-99-1-7.3	Jun-99	X	methylene chloride=0.015	Aroclor 1242 = **0.26**				53
SS-51MRP3-99-W1A-2.3	Oct-99		ND	<0.01	ND		ND	
SS-51MRP3-99-W1B-2.3	Oct-99		ND	<0.01	ND		ND	
SS-51MRP3-99-W2A-3.0	Oct-99		ND	Aroclor-1242=0.058	Hydraulic/Motor Oil=62		ND	
SS-51MRP3-99-W2B-3.0	Oct-99		ND	<0.01	Hydraulic/Motor Oil=50		ND	
SS-51MRP3-99-W3A-1.5	Oct-99	X	ND	<0.01	ND		ND	
SS-51MRP3-99-W4A-4.3	Oct-99	X	ND	Aroclor-1242=**0.71**	Hydraulic/Motor Oil=370		Chr=0.012 Py=0.041	
SS-51MRP3-99-W5A-1.5	Oct-99	X	ND	<0.01	Hydraulic/Motor Oil=24		ND	
SS-51MRP3-99-W5B-1.5	Oct-99		ND	<0.01	Hydraulic/Motor Oil=30		Chr=0.012	
SS-51MRP3-99-W6A-4.5	Oct-99	X	ND	**Aroclor-1242=4.8**	Hydraulic/Motor Oil=9100		ND	
SS-51MRP3-99-W6B-4.5	Oct-99		ND	Aroclor-1242=0.016	Hydraulic/Motor Oil=60		ND	
SS-51MRP3-99-W7A-4.0	Oct-99	X	ND	**Aroclor-1242=2.1**	Hydraulic/Motor Oil=5300		ND	
SS-51MRP3-99-W8A-4.5	Oct-99		ND	Aroclor-1242=**0.45**	Hydraulic/Motor Oil=860		B(a)A=0.011 B(b)F=0.015 B(k)F=0.012 Chr=0.01 Fluora=0.022 Py=0.081	

Table 2a.
Soil Sampling Results for Organics
AOC 9-9: Building 51 Sanitary Sewer and Drainage System
(Concentrations in mg/kg)

Boring/Sample ID	Date Sampled	Excavated*	VOCs 8260	PCBs 8080 or 8082	Fuels 8015M	TPH-D 8015M	PAHs 8310	Oil & Grease 413.1
SS-51MRP3-99-W8B-4.5	Oct-99		ND	Aroclor-1242=**0.54**	Hydraulic/Motor Oil=870		Chr=0.011 Fluora=0.021 Py=0.053	
SS-51MRP3-99-W10A-5.5	Oct-99	X	ND	<0.01	ND		ND	
SS-51MRP3-99-W10B-6.5	Oct-99	X	ND	<0.01	Hydraulic/Motor Oil=25		ND	
SS-51MRP3-99-W11A-4.0	Oct-99	X	ND	**Aroclor-1242=7.0**	Hydraulic/Motor Oil=4000		Py=0.024	
SS-51MRP3-99-W11B-4.0	Oct-99	X	ND	**Aroclor-1242=6.6**	Hydraulic/Motor Oil=5200		Py=0.037	
SS-51MRP3-00-W11C-4.0	Feb-00	X		**Aroclor-1242=2.2**				
SS-51MRP3-99-W12A-1.8	Oct-99	X	ND	<0.01	ND		ND	
SS-51MRP3-99-W12B-1.8	Oct-99		ND	<0.01	ND		ND	
SS-51MRP3-99-W13A-4.5	Oct-99	X	ND	**Aroclor-1242=3.9**	Hydraulic/Motor Oil=2700		An=0.0022 B(a)A=0.017 B(b)F=0.022 Chr=0.011 Fluora=0.057 Py=0.16	
SS-51MRP3-99-W13B-4.5	Oct-99		ND	Aroclor-1242=**0.60**	Hydraulic/Motor Oil=620		Py=0.040	
SS-51MRP3-99-W14A-4.0	Oct-99	X	ND	**Aroclor-1242=8.2**	Hydraulic/Motor Oil=14,000		Py=0.083	
SS-51MRP3-99-W14B-4.0	Oct-99		ND	Aroclor-1242=**0.65**	Hydraulic/Motor Oil=1100		Py=0.063	
SS-51MRP3-99-W15A-2.0	Oct-99	X	ND	**Aroclor-1242=2.1**	Hydraulic/Motor Oil=1800		An=0.001 Py=0.059	
SS-51MRP3-99-W15B-2.0	Oct-99	X	ND	Aroclor-1242=0.058	Hydraulic/Motor Oil=68		ND	
SS-51MRP3-99-W16A-4.5	Oct-99	X	ND	**Aroclor-1242=1.2**	Hydraulic/Motor Oil=1100		Py=0.057	
SS-51MRP3-99-W16B-4.5	Oct-99	X	ND	Aroclor-1242=**0.52**	Hydraulic/Motor Oil=690		Py=0.045	
SS-51MRP3-99-W17A-3.0	Oct-99	X	ND	Aroclor-1242=0.10	Hydraulic/Motor Oil=230		ND	
SS-51MRP3-99-W17B-3.0	Oct-99		ND	<0.01	ND		ND	
SS-51MRP3-99-W18A-4.5	Oct-99	X	ND	Aroclor-1242=0.16	Hydraulic/Motor Oil=280		ND	
SS-51MRP3-99-W18B-4.5	Oct-99		ND	Aroclor-1242=0.079	WD-40=130		ND	
SS-51MRP3-99-W19A-4.5	Oct-99	X	ND	**Aroclor-1242=6.8**	Hydraulic/Motor Oil=7700		Acen=0.47 An=0.0027 Fluora=0.098 Py=0.061	
SS-51MRP3-99-W19B-4.5	Oct-99		ND	Aroclor-1242=**0.57**	Hydraulic/Motor Oil=690		An=0.0014 B(b)F=0.011 Py=0.056	
SS-51MRP3-99-W20A-4.8	Oct-99	X	ND	Aroclor-1242=0.072	Hydraulic/Motor Oil=78		ND	
SS-51MRP3-99-W20B-4.8	Oct-99	X	ND	Aroclor-1242=**0.27**	Hydraulic/Motor Oil=420		Fluora=0.19	
SS-51MRP3-99-W21A-3.5	Oct-99		ND	Aroclor-1242=0.17	Hydraulic/Motor Oil=540		ND	
SS-51MRP3-99-W21B-3.5	Oct-99		ND	<0.01	ND		ND	
SS-51MRP3-99-F1-6.5	Oct-99		ND	Aroclor-1242=0.13	Hydraulic/Motor Oil=160		ND	

Table 2a.
Soil Sampling Results for Organics
AOC 9-9: Building 51 Sanitary Sewer and Drainage System
(Concentrations in mg/kg)

Boring/Sample ID	Date Sampled	Excavated*	VOCs 8260	PCBs 8080 or 8082	Fuels 8015M	TPH-D 8015M	PAHs 8310	Oil & Grease 413.1
SS-51MRP3-99-F1-7.3	Oct-99		ND	Aroclor-1242=**0.21**	Hydraulic/Motor Oil=440		An=0.0014 B(a)A=0.044 **B(a)P=0.074** B(b)F=0.074 B(ghi)P=0.029 B(k)F=0.036 Chr=0.061 Fluora=0.072 I(123cd)P=0.032 Py=0.093	
SS-51MRP3-99-F2-6.5	Oct-99		TCE=0.011	<0.01	ND		ND	
SS-51MRP3-99-F2-8.5	Oct-99		ND	<0.01	ND		ND	
SS-51MRP3-99-F3-6.8	Oct-99		ND	<0.01	ND		An=0.002 B(a)A=0.012 Chr=0.024 Fluora=0.029 Phen=0.011	
SS-51MRP3-99-F3-8.2	Oct-99		ND	Aroclor-1242=0.024	Hydraulic/Motor Oil=28		Chr=0.014	
SS-51MRP3-99-F4-6.6	Oct-99		ND	Aroclor-1242=**0.31**	Hydraulic/Motor Oil=280		An=0.002 B(a)A=0.01 Chr=0.021 Fluora=0.028	
SS-51MRP3-99-F4-8.2	Oct-99		ND	Aroclor-1242=0.034	Hydraulic/Motor Oil=76		An=0.015 B(a)A=0.043 B(a)P=0.045 B(b)F=0.041 B(ghi)P=0.022 B(k)F=0.026 Chr=0.055 Fluora=0.2 I(123cd)P=0.023 Phen=0.068 Py=0.13	
SS-51MRP3-99-F5-6.5	Oct-99		ND	Aroclor-1242=0.027	Hydraulic/Motor Oil=150		An=0.0024 B(a)A=0.019 B(b)F=0.017 Chr=0.018 Fluora=0.07 I(123cd)P=0.012 Py=0.049	

Table 2a.
Soil Sampling Results for Organics
AOC 9-9: Building 51 Sanitary Sewer and Drainage System
(Concentrations in mg/kg)

Boring/Sample ID	Date Sampled	Excavated*	VOCs 8260	PCBs 8080 or 8082	Fuels 8015M	TPH-D 8015M	PAHs 8310	Oil & Grease 413.1
SS-51MRP3-99-F5-8.0	Oct-99		ND	Aroclor-1242=**0.28**	Hydraulic/Motor Oil=470		An=0.015 B(a)A=0.071 B(a)P=**0.063** B(b)F=0.074 B(ghi)P=0.036 B(k)F=0.037 Chr=0.074 Fluora=0.26 I(123cd)P=0.033 Phen=0.036 Py=0.21	
SS-51MRP3-99-FW9-4.0	Oct-99	X	ND	**Aroclor-1242=4.4**	Hydraulic/Motor Oil=3600		Chr=0.015	
Test Pit 4								
SS-51-MRP4-00-F1-4.5	Feb-00		ND	<0.01	Hydraulic/Motor Oil=25			
SS-51-MRP4-00-F1-6.0	Feb-00		ND	<0.01	ND			
SS-51-MRP4-00-F2-4.5	Feb-00		ND	<0.01	ND			
SS-51-MRP4-00-F2-6.0	Feb-00		ND	<0.01	ND			
SS-51-MRP4-00-F3-4.5	Feb-00		ND	<0.01	ND			
SS-51-MRP4-00-F3-6.0	Feb-00		ND	<0.01	Hydraulic/Motor Oil=41			
SS-51-MRP4-00-W1A-1.9	Feb-00		ND	Aroclor-1242=0.028	Hydraulic/Motor Oil=310			
SS-51-MRP4-00-W1B-2.2	Feb-00		ND	<0.01	Hydraulic/Motor Oil=30			
SS-51-MRP4-00-W2A-3.0	Feb-00		ND	<0.01	Hydraulic/Motor Oil=42			
SS-51-MRP4-00-W2B-3.0	Feb-00		ND	<0.01	ND			
SS-51-MRP4-00-W3A-2.8	Feb-00		ND	<0.01	ND			
SS-51-MRP4-00-W3B-2.8	Feb-00		ND	<0.01	ND			
Test Pit 5								
SS-51MRP5-99-F1-6.5	Oct-99		TCE=0.017	<0.01	ND		Chr=0.012	
SS-51MRP5-99-F1-8.0	Oct-99		TCE=0.058	<0.01	ND		An=0.0011 B(a)A=0.012 B(b)F=0.017 Chr=0.014 Fluora=0.030 Pyr=0.025	
SS-51MRP5-99-F2-6.5	Oct-99		ND	Aroclor-1242=0.058	Hydraulic/Motor Oil=88		An=0.0014 B(b)F=0.01	

Table 2a.
Soil Sampling Results for Organics
AOC 9-9: Building 51 Sanitary Sewer and Drainage System
(Concentrations in mg/kg)

Boring/Sample ID	Date Sampled	Excavated*	VOCs 8260	PCBs 8080 or 8082	Fuels 8015M	TPH-D 8015M	PAHs 8310	Oil & Grease 413.1
SS-51MRP5-99-F2-7.8	Oct-99		TCE=0.0053	<0.01	ND		An=0.0010 B(a)A=0.074 B(a)P=**0.082** B(b)F=0.084 B(k)F=0.043 Chr=0.090 Fluora=0.19 I(123cd)P=0.045 Py=0.16	
SS-51MRP5-99-F3-6.5	Oct-99		ND	<0.01	ND		An=0.0013 B(a)A=0.019 B(b)F=0.022 Chr=0.024 Fluora=0.056 Py=0.050	
SS-51MRP5-99-F3-7.8	Oct-99		TCE=0.016	<0.01	ND		An=0.0021 B(a)A=0.033 B(a)P=0.036 B(b)F=0.033 B(k)F=0.018 Chr=0.036 Fluora=0.072 I(123cd)P=0.02 Py=0.052	
SS-51MRP5-99-W1A-4.8	Oct-99		ND	<0.01	ND		ND	
SS-51MRP5-99-W1B-4.8	Oct-99		ND	Aroclor-1242=0.011	ND		ND	
SS-51MRP5-99-W2A-4.8	Oct-99		TCE=0.014 1,2,3-TCB=0.0054	<0.01	ND		ND	
SS-51MRP5-99-W2B-4.8	Oct-99		TCE=0.014	<0.01	ND		ND	
SS-51MRP5-99-W3A-4.8	Oct-99	X	n-butylbenzene=0.016 sec-butylbenzene=0.026 cis-1,2-DCE=0.005 PCE=0.048 TCE=0.16 1,2,4-TMB=0.044	**Aroclor-1242=1.9**	Hydraulic/Motor Oil=2600		An=0.0014 B(a)A=0.013 B(b)F=0.017 B(k)F=0.016 Chr=0.012 Fluora=0.036 Pyr=0.11	
SS-51MRP5-99-W3B-4.8	Oct-99		PCE=0.0092 TCE=0.030	Aroclor-1242=**0.40**	Hydraulic/Motor Oil=430		Pyr=0.038	
SS-51MRP5-99-W4A-4.9	Oct-99		TCE=0.013	<0.01	ND		ND	
SS-51MRP5-99-W4B-4.9	Oct-99		TCE=0.017	<0.01	ND		ND	

Table 2a.

Soil Sampling Results for Organics
AOC 9-9: Building 51 Sanitary Sewer and Drainage System
(Concentrations in mg/kg)

Boring/Sample ID	Date Sampled	Excavated*	VOCs 8260	PCBs 8080 or 8082	Fuels 8015M	TPH-D 8015M	PAHs 8310	Oil & Grease 413.1
SS-51MRP5-99-W5A-4.5	Oct-99		TCE=0.0078	<0.01	ND		B(b)F=0.012 Chr=0.015 Fluora=0.032 Pyr=0.025	
SS-51MRP5-99-W5B-4.5	Oct-99		TCE=0.0073	<0.01	ND		B(a)A=0.012 B(b)F=0.014 Chr=0.015 Fluora=0.030 Pyr=0.024	
SS-51MRP5-99-W6A-4.5	Oct-99		ND	<0.01	ND		ND	
SS-51MRP5-99-W6B-4.5	Oct-99		TCE=0.0054	<0.01	ND		Fluora=0.025	
SS-51MRP5-99-W7A-4.5	Oct-99		ND	<0.01	ND		ND	
SS-51MRP5-99-W7B-4.5	Oct-99		ND	<0.01	ND		ND	
SS-51MRP5-99-FW8A-5.0	Oct-99		PCE=0.23 TCE=0.026 1,2,4-TMB=0.011	Aroclor-1242=0.076	Hydraulic/Motor Oil=590		An=0.0033 B(a)A=0.019 B(b)F=0.017 Chr=0.021 Fluora=0.079 Phen=0.023 Pyr=0.052	
SS-51MRP5-99-FW8B-6.2	Oct-99		ND	<0.01	Hydraulic/Motor Oil=30		ND	

ND (or < reporting limit) = Not detected
= Not analyzed

Concentrations of analytes detected in soil samples above PRGs for residential soil are shown in **bold**.
PCBs with the Aroclor number in **bold** for soil samples are above the 1 mg/kg Interim Measure cleanup level for s
* - X indicates that sample was collected from material that has been excavated

PRGs for Residential Soil for Detected Organic Analytes (mg/kg)

PCBs	0.2						
acenaphthene (Acen)	2,600	benzo(k)fluoranthene (B(k)F)	5.6	cis-1,2-dichloroethene (cis-1,2-DCE)	42	n-butylbenzene	130
acenaphthylene (Aceny)	2,600	chrysene (Chr)	56	methylene chloride	8.5	sec-butylbenzene	100
anthracene (An)	14,000	fluoranthene (Fluora)	2,000	tetrachloroethene (PCE)	4.7	1,2,3-trichlorobenzene (1,2,3-TCB)	none
benzo(a)anthracene (B(a)A)	0.56	ideno(123cd)pyrene (I(123cd)P)	0.56	trichloroethene (TCE)	2.7	1,2,4-trimethylbenzene (1,2,4-TMB)	51
benzo(a)pyrene (B(a)P)	0.056	phenanthrene (Phen)	none				
benzo(b)fluoranthene (B(b)F)	0.56	pyrene (Py)	1,500				
benzo(ghi)perylene (B(ghi)P)	none						

Table 2b.

Soil Sampling Results for Metals
AOC 9-9: Building 51 Sanitary Sewer and Drainage System
(Concentrations in mg/kg)

Boring/Sample ID	Date Sampled	Excavated*	Sb	As	Ba	Be	Cd	Cr	CrVI	Co	Cu	Pb	Hg	Mo	Ni	Se	Ag	Tl	V	Zn
*Maximum Background Concentrations***			5.5	19.1	323.6	1.0	2.7	99.6		22.2	69.4	16.1	0.4	7.4	119.8	5.6	1.8	27.1	74.3	106.1
USEPA Region 9 PRGs			30	0.38	5200	150	37	210	30	3300	2800	400	22	370	1500	370	370	6	520	22000
California Modified PRGs							9		0.2			130			150					
Soil Borings																				
SB51-96-8-4	Apr-96	X	<5	1.4	180	0.6	<0.5	110	NA	12	23	<5	<0.05	<2.5	81	<0.5	<1	<4	49	53
SB51-96-8-6	Apr-96	X	<5	1.4	180	0.6	<0.5	96	NA	11	22	<5	<0.05	<2.5	90	<0.5	<1	<4	50	55
SB51-96-9-4	Apr-96		<5	7.5	47	0.53	<0.5	120	NA	12	<1	25	<0.05	<2.5	72	<0.5	<1	<4	47	50
SB51-96-9-6	Apr-96		<5	1.7	98	0.73	<0.5	73	NA	14	23	<5	<0.05	<2.5	94	<0.5	<1	<4	59	63
SB51-96-11-6	Apr-96		<5	4.9	140	0.54	<0.5	48	NA	12	24	<5	<0.05	<2.5	66	<0.5	<1	<4	38	51
SB51-96-12-4	Apr-96		<5	13	220	0.32	<0.5	60	NA	12	30	<5	<0.05	<2.5	69	<0.5	<1	<4	61	59
SB51-96-12-6	Apr-96		<5	10	120	0.25	<0.5	68	NA	14	25	<5	<0.05	<2.5	45	<0.5	<1	<4	44	62
SB51-96-12-8	Apr-96		<5	6.7	120	0.21	<0.5	64	NA	12	30	12	<0.05	<2.5	45	<0.5	<1	<4	34	59
SB51-98-1-2.1	Feb-98	X	<0.2	1.9	106	<0.2	0.2	7.0	NA	2.1	12.6	3.7	<0.2	0.35	48.9	0.25	<0.2	<0.2	15.7	17.2
SB51-98-1-4	Jun-98	X	<10	5.3	227	<1	<1	86.0	NA	15	32	<5	<0.2	<5	94	<0.5	<2	<10	58	67
SB51-98-1-6	Jun-98		<10	1.9	212	<1	<1	84.0	NA	13	32	<5	<0.2	<5	95	<0.5	<2	<10	51	62
SB51-98-2-2	Feb-98		<0.2	0.71	57.5	<0.2	<0.2	16.5	NA	0.92	26.1	74	<0.2	0.47	25.7	<0.2	<0.2	<0.2	11.6	86.4
SB51-98-2-5	Jun-98		<10	<1	64	<1	<1	80	NA	22	8	<5	<0.2	<5	32	<0.5	<2	<10	30	66
SB51-98-2-6.5	Jun-98		<10	<1	81	<1	<1	65	NA	22	6.5	<5	<0.2	<5	47	<0.5	<2	<10	37	67
SB51-98-3-2.4	Feb-98		<0.2	2.2	94.9	<0.2	<0.2	22.5	NA	3.3	11.7	4.7	<0.2	0.48	24.1	0.63	0.47	<0.2	14.4	19.4
SB51-98-3-3.4	Feb-98		<0.2	0.52	113	<0.2	<0.2	8.8	NA	2.2	13.8	2.6	<0.2	<0.2	23.8	<0.2	<0.2	<0.2	16.7	24
SB51-98-3-4	Jun-98		<10	6	188	<1	<1	77	NA	15	34	<5	<0.2	<5	81	<0.5	<2	<10	60	70
SB51-98-3-6	Jun-98		<10	6.5	254	<1	2.5	76	NA	16	38	<5	<0.2	<5	90	<0.5	<2	<10	61	71
SB51-98-4-4	Jun-98		<10	5.6	256	<1	<1	144	NA	13	29	<5	<0.2	<5	79	<0.5	<2	<10	54	58
SB51-98-4-6	Jun-98		<10	3.2	218	<1	<1	81	NA	13	32	<5	<0.2	<5	88	<0.5	<2	<10	51	56
SB51-98-5-3	Feb-98		<0.2	1.1	114	<0.2	<0.2	23.4	NA	2.2	7.7	4	<0.2	<0.2	19.2	0.81	<0.2	<0.2	12.7	17:8
SB51-98-5-4	Jun-98		<10	11	219	<1	<1	86	NA	16	37	5.3	<0.2	<5	86	<0.5	<2	<10	62	70
SB51-98-5-6	Jun-98		<10	8.5	223	<1	<1	72	NA	14	40	<5	<0.2	<5	84	<0.5	<2	<10	50	64
SB51-98-6-2.3	Feb-98		<0.2	1.7	129	<0.2	<0.2	25.8	NA	1.2	9.9	4.5	<0.2	<0.2	27.3	0.45	<0.2	<0.2	17.1	20.1
SB51-98-6-4	Jun-98		<10	3.9	184	<1	<1	96	NA	13	34	<5	<0.2	<5	82	<0.5	<2	<10	57	68
SB51-98-6-6	Jun-98		<10	2.3	196	<1	<1	82	NA	12	28	<5	<0.2	<5	89	<0.5	<2	<10	49	57
SB51-98-7-2.0	Jun-98	X	<10	6.1	193	<1	<1	78	NA	14	34	<5	0.89	<5	85	<0.5	<2	<10	56	68
SB51-98-7-2.3	Feb-98	X	<0.2	1.1	64.5	<0.2	<0.2	21.2	NA	3.8	4.4	2.8	<0.2	<0.2	8	<0.2	<0.2	<0.2	13	19.1
SB51-98-7-3	Feb-98	X	<0.2	1.1	85.6	<0.2	<0.2	39.3	NA	2.1	9.3	4.8	<0.2	<0.2	13.9	<0.2	<0.2	<0.2	16.4	22.3
SB51-98-7-4	Jun-98		<10	5.8	299	<1	<1	67	NA	14	30	<5	<0.2	<5	81	<0.5	<2	<10	56	59
SB51-98-7-5	Jun-98		<10	10	358	<1	<1	69	NA	12	24	6.6	<0.2	<5	72	<0.5	<2	<10	38	61
SB51-98-8-1.8	Feb-98		<0.2	0.99	195	<0.2	0.3	18.1	NA	2.9	2.9	1.8	<0.2	0.33	6.3	<0.2	<0.2	<0.2	12.1	16.8
SB51-98-8-5	Jun-98		<10	<1	83	<1	<1	104	NA	20	14	<5	<0.2	<5	35	<0.5	<2	<10	69	64
SB51-98-8-6.5	Jun-98		<10	1.2	87	<1	<1	91	NA	14	10	<5	<0.2	<5	28	<0.5	<2	<10	118	51

Table 2b.

Soil Sampling Results for Metals
AOC 9-9: Building 51 Sanitary Sewer and Drainage System
(Concentrations in mg/kg)

Boring/Sample ID	Date Sampled	Excavated*	Sb	As	Ba	Be	Cd	Cr	CrVI	Co	Cu	Pb	Hg	Mo	Ni	Se	Ag	Tl	V	Zn
*Maximum Background Concentrations***			5.5	19.1	323.6	1.0	2.7	99.6		22.2	69.4	16.1	0.4	7.4	119.8	5.6	1.8	27.1	74.3	106.1
USEPA Region 9 PRGs			30	0.38	5200	150	37	210	30	3300	2800	400	22	370	1500	370	370	6	520	22000
California Modified PRGs							9		0.2			130			150					
SB51-98-9-2.6	Feb-98		<0.2	3.9	94.5	<0.2	<0.2	12.9	NA	3.2	11	18.6	<0.2	<0.2	18.1	0.26	<0.2	<0.2	21.3	26.4
SB51-98-9-3.6	Feb-98		<0.2	3.2	143	<0.2	<0.2	5.7	NA	3.3	4.5	6.3	<0.2	<0.2	8.9	<0.2	<0.2	<0.2	11.2	25.7
SB51-98-9-4	Jun-98		<10	<1	67	<1	<1	77	NA	20	10	<5	<0.2	<5	22	<0.5	<2	<10	72	63
SB51-98-9-6	Jun-98		<10	1.1	77	<1	<1	86	NA	20	10	<5	<0.2	<5	22	<0.5	<2	<10	72	64
Test Pit 1																				
SS-51MRPit-96-1-3	Mar-96	X	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRPit-96-2-2	Mar-96	X	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.82	NA	NA	NA	NA	NA	NA	NA
SS-51MRPit-96-4-4.5	Mar-96	X	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRPit-96-5-4.2	Mar-96	X	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRPit-6-2	Apr-96		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.23	NA	NA	NA	NA	NA	NA	NA
Test Pit 3																				
SS-51MRPit3-98-1-4.0	Jul-98	X	<10	2.2	156	<1	<1	66	NA	12	41	8.3	<0.2	<5	93	<1	<2	<10	41	62
SS-51MRPit3-98-2-4.0	Jul-98	X	<10	5.4	221	<1	<1	33	NA	7.5	23	9.3	<0.2	<5	43	<1	<2	<10	29	40
SS-51MRPit3-98-3-6.0	Jul-98		<10	1.2	271	<1	<1	50	NA	11	32	5.0	<0.2	<5	85	<1	<2	<10	31	55
SS-51MRPit3-98-4-3.5	Jul-98	X	<10	4.5	256	<1	<1	83	NA	13	44	9.4	<0.2	<5	90	<1	<2	<10	51	72
SS-51MRPit3-98-5-4.0	Jul-98	X	<10	10	178	<1	<1	73	NA	14	45	12	<0.2	<5	83	<1	<2	<10	55	72
SS-51MRPit3-98-6-6.3	Jul-98		<10	9.7	248	<1	<1	113	NA	16	40	14	<0.2	<5	116	1.4	<2	<10	82	81
SS-51MRPit3-98-7-5.8	Jul-98		<10	7.2	272	<1	<1	95	NA	16	46	10	<0.2	<5	103	<1	<2	<10	64	84
SS-51MRPit3-98-8-7.5	Jul-98	X	<10	2.2	184	<1	<1	72	NA	15	37	7.0	<0.2	<5	86	<1	<2	<10	57	68
SS-51MRPit3-98-9-3.0	Jul-98		<10	5.2	146	<1	<1	74	NA	13	53	8.8	<0.2	<5	79	<1	<2	<10	51	73
SS-51MRPit3-98-10-3.0	Jul-98	X	<10	4.3	195	<1	<1	75	NA	13	39	10	<0.2	<5	82	<1	<2	<10	42	66
SS-51MRP3-99-W1A-2.3	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-W1B-2.3	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-W2A-3.0	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-W2B-3.0	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-W3A-1.5	Oct-99	X	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-W4A-4.3	Oct-99	X	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-W5A-1.5	Oct-99	X	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-W5B-1.5	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-W6A-4.5	Oct-99	X	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-W6B-4.5	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-W7A-4.0	Oct-99	X	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-W8A-4.5	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-W8B-4.5	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-W10A-5.5	Oct-99	X	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-W10B-6.5	Oct-99	X	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-W11A-4.0	Oct-99	X	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA

Table 2b.
Soil Sampling Results for Metals
AOC 9-9: Building 51 Sanitary Sewer and Drainage System
(Concentrations in mg/kg)

Boring/Sample ID	Date Sampled	Excavated*	Sb	As	Ba	Be	Cd	Cr	CrVI	Co	Cu	Pb	Hg	Mo	Ni	Se	Ag	Tl	V	Zn
*Maximum Background Concentrations***			5.5	19.1	323.6	1.0	2.7	99.6		22.2	69.4	16.1	0.4	7.4	119.8	5.6	1.8	27.1	74.3	106.1
USEPA Region 9 PRGs			30	0.38	5200	150	37	210	30	3300	2800	400	22	370	1500	370	370	6	520	22000
California Modified PRGs							9		0.2			130			150					
SS-51MRP3-99-W11B-4.0	Oct-99	X	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-W12A-1.8	Oct-99	X	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-W12B-1.8	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-W13A-4.5	Oct-99	X	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-W13B-4.5	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-W14A-4.0	Oct-99	X	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-W14B-4.0	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-W15A-2.0	Oct-99	X	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-W15B-2.0	Oct-99	X	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-W16A-4.5	Oct-99	X	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-W16B-4.5	Oct-99	X	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-W17A-3.0	Oct-99	X	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-W17B-3.0	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-W18A-4.5	Oct-99	X	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-W18B-4.5	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-W19A-4.5	Oct-99	X	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-W19B-4.5	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-W20A-4.8	Oct-99	X	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-W20B-4.8	Oct-99	X	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-W21A-3.5	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-W21B-3.5	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-F1-6.5	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-F1-7.3	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-F2-6.5	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-F2-8.5	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-F3-6.8	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-F3-8.2	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-F4-6.6	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-F4-8.2	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-F5-6.5	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-F5-8.0	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP3-99-FW9-4.0	Oct-99	X	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA

Test Pit 5

SS-51MRP5-99-F1-6.5	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP5-99-F1-8.0	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP5-99-F2-6.5	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP5-99-F2-7.8	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA
SS-51MRP5-99-F3-6.5	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA

Table 2b.

Soil Sampling Results for Metals
AOC 9-9: Building 51 Sanitary Sewer and Drainage System
(Concentrations in mg/kg)

			Sb	As	Ba	Be	Cd	Cr	CrVI	Co	Cu	Pb	Hg	Mo	Ni	Se	Ag	Tl	V	Zn
*Maximum Background Concentrations***			5.5	19.1	323.6	1.0	2.7	99.6		22.2	69.4	16.1	0.4	7.4	119.8	5.6	1.8	27.1	74.3	106.1
USEPA Region 9 PRGs			30	0.38	5200	150	37	210	30	3300	2800	400	22	370	1500	370	370	6	520	22000
California Modified PRGs							9		0.2			130			150					
Boring/Sample ID	**Date Sampled**	**Excavated***																		
SS-51MRP5-99-F3-7.8	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	*<0.2*	NA	NA	NA	NA	NA	NA	NA
SS-51MRP5-99-W1A-4.8	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	*<0.2*	NA	NA	NA	NA	NA	NA	NA
SS-51MRP5-99-W1B-4.8	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	*<0.2*	NA	NA	NA	NA	NA	NA	NA
SS-51MRP5-99-W2A-4.8	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	*<0.2*	NA	NA	NA	NA	NA	NA	NA
SS-51MRP5-99-W2B-4.8	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	*<0.2*	NA	NA	NA	NA	NA	NA	NA
SS-51MRP5-99-W3A-4.8	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	*<0.2*	NA	NA	NA	NA	NA	NA	NA
SS-51MRP5-99-W3B-4.8	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	*<0.2*	NA	NA	NA	NA	NA	NA	NA
SS-51MRP5-99-W4A-4.9	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	*<0.2*	NA	NA	NA	NA	NA	NA	NA
SS-51MRP5-99-W4B-4.9	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	*<0.2*	NA	NA	NA	NA	NA	NA	NA
SS-51MRP5-99-W5A-4.5	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	*<0.2*	NA	NA	NA	NA	NA	NA	NA
SS-51MRP5-99-W5B-4.5	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	*<0.2*	NA	NA	NA	NA	NA	NA	NA
SS-51MRP5-99-W6A-4.5	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	*<0.2*	NA	NA	NA	NA	NA	NA	NA
SS-51MRP5-99-W6B-4.5	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	*<0.2*	NA	NA	NA	NA	NA	NA	NA
SS-51MRP5-99-W7A-4.5	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	*<0.2*	NA	NA	NA	NA	NA	NA	NA
SS-51MRP5-99-W7B-4.5	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	*<0.2*	NA	NA	NA	NA	NA	NA	NA
SS-51MRP5-99-FW8A-5.0	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	*<0.2*	NA	NA	NA	NA	NA	NA	NA
SS-51MRP5-99-FW8B-6.2	Oct-99		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	*<0.2*	NA	NA	NA	NA	NA	NA	NA

* - X indicates that sample was collected from material that has been excavated

NA	= Not analyzed
<5	= Not detected (reporting limit shown)
25	= Concentration above background but below PRG.
40	= Concentration above both background and PRG.

Table 3.

Product and Wipe Sampling Results for Organics
AOC 9-9: Building 51 Sanitary Sewer and Drainage System
(Concentrations in mg/kg)

Boring/Sample ID	Date Sampled	SVOCs 8270	PCBs 8080 or 8082	Fuels 8015M	PAHs 8310	Hg SW7471
Test Pit 2						
SS-51MRP2-PROD	Nov-96		Aroclor 1242=430	Motor Oil=950,000		*<0.2*
Test Pit 3						
51MRPIT3-PRODUCT	Jul-98	ND	Aroclor 1242=570	Hydraulic/Motor Oil=640,000	Acenapthene=57 Acenapthylene=19 Anthracene=1.3 Benzo(a)anthracene=3.5 Benzo(b)fluoranthene=3.6 Fluoranthene=17 Pyrene=20	
Pump Oil Samples						
51MRBSMT-EPUMPOIL#1	Apr-99		<0.3			
51MRBSMT-EPUMPOIL#3	Apr-99		<0.3			
Wipe Samples (Concrete wall east of Pit 3)						
51MR-99WALLWIPE-1	Apr-99		<0.003 mg/wipe			
51MR-99WALLWIPE-2-5.0'	Apr-99			Crude/Waste Oil = 1.7 mg/wipe		

ND (or < reporting limit) (shaded) = Not detected

(blank) = Not analyzed

Table 4.

Groundwater Sampling Results
AOC 9-9: Building 51 Sanitary Sewer and Drainage System
(Concentrations in μg/L)

	Analyte	Organics				Metals
		VOCs	PCBs	Total O&G	Fuel Identification	Metals
Sample ID	Date Sampled	8260	8080	9070	8015M	6000 and 7000 Series
SB51-96-6	4/9/96	TCE=40.8 cis-1,2-DCE=31.2 trans-1,2-DCE=21.5 vinyl chloride=16.7 toluene=1.3 p-isopropyltoluene=1.2				
	4/17/96		<0.5			
	5/2/96					
	5/8/96			<5000		
	11/11/96	All ND (<100 or higher)				
	12/16/97	TCE=1.1 cis-1,2-DCE=3.6 trans-1,2-DCE=4.0				
SB51-96-8	4/9/96	All ND (<1 or <2)	Aroclor-1242=93	7300		
	5/2/96					
	11/11/96	cis-1,2-DCE=14.9 trans-1,2-DCE=3.2 1,1-DCA=6.0 Vinyl chloride=5.3				
	11/22/96		Aroclor-1242=56			
	12/11/96					Total arsenic = 2.6 Total barium = 300
	12/16/97	cis-1,2-DCE=5.3 1,1-DCA=2.6 Vinyl chloride=2.0				
SB51-96-12	4/9/96	1,1-DCA=1.1 Vinyl chloride=1.4				

Table 4.
Groundwater Sampling Results
AOC 9-9: Building 51 Sanitary Sewer and Drainage System
(Concentrations in µg/L)

		Organics				Metals
	Analyte	VOCs	PCBs	Total O&G	Fuel Identification	Metals
Sample ID	Date Sampled	8260	8080	9070	8015M	6000 and 7000 Series
SB51-96-12	4/11/96		Aroclor-1242=6.2			
	4/15/96			16,000		
	5/2/96					
	11/8/96	cis-1,2-DCE=1.4 1,1-DCA=2.3				
	11/11/96		Aroclor-1242=31			
	12/11/96					Total arsenic = 27 Total barium = 170 Total vanadium = 39
	12/16/97	cis-1,2-DCE=4.4 1,1-DCA=3.7 Vinyl chloride=3.0				
	12/17/98	1,1,1-TCA=1.1 cis-1,2-DCE=1.5 1,1-DCA=2.4 Vinyl chloride=3.0 MTBE=2.1				
	12/22/98		Aroclor-1242=12			
	6/18/99	cis-1,2-DCE=1.6 1,1-DCA=2.3 Vinyl chloride=1.7				
SB51-98-1	4/22/99		<0.2			
SB51-98-3	6/15/98	TCE=2.3 cis-1,2-DCE=4.2 1,1-DCA=2.6 Vinyl chloride=3.7				
	6/30/98				Crude/waste oil = 130	

Table 4.

Groundwater Sampling Results
AOC 9-9: Building 51 Sanitary Sewer and Drainage System
(Concentrations in µg/L)

	Analyte	Organics				Metals
		VOCs	PCBs	Total O&G	Fuel Identification	Metals
Sample ID	Date Sampled	8260	8080	9070	8015M	6000 and 7000 Series
SB51-98-3	7/14/98		<0.2			Dissolved arsenic = 15 Dissolved molybdenum = 69
	4/22/99		<0.2			
SB51-98-4	6/15/98	All ND (<1 or <2)				
	7/10/98				Crude/waste oil = 4,900	Dissolved arsenic = 15 Dissolved barium = 130 Dissolved molybdenum = 50 Dissolved selenium = 2.1 Dissolved vanadium = 12
	7/14/98		Aroclor-1242=22			
	4/22/99		Aroclor-1242=0.37			
SB51-98-5	6/30/98		Aroclor-1260=0.92		Crude/waste oil = 1,000	
	7/14/98					Dissolved arsenic = 11 Dissolved selenium = 5.0
	4/22/99		<0.2			
SB51-98-6	6/15/98	All ND (<1 or <2)				
	7/10/98		<0.2		Crude/waste oil = 780	Dissolved arsenic = 29 Dissolved molybdenum = 91 Dissolved vanadium = 28
	4/22/99		<0.2			
SB51-98-7	6/15/98	cis-1,2-DCE=3.6 1,1-DCA=1.9 Toluene=1.1				

Table 5a.
Surface Water Sampling Results for Organics
North Fork Strawberry Creek
(Concentrations in µg/L)

Date Sampled	VOCs (8260)	SVOCs (8270)	PCBs (8080)
Feb-93	ND		
Apr-93	ND		
Aug-93	ND ND (D)		
Mar-94	ND		
Jul-94	ND ND (D)		
Jan-95	ND		
May-95 (a)	1,1,1-TCA=0.95 1,1,1-TCA = 0.91 (D)		
Jul-95	ND		
Jan-96	ND		
Apr-96 (b)	ND		
Apr-97	ND		
Jan-98	ND		
Apr-98	ND	diethyl phthalate = 2.2	
Jul-98		ND	
Apr-99	ND		
Jul-99			<0.2
Jul-99 (a)			<0.2
Jan-00	ND		

ND = Not detected above quantitation limit

(D) = Duplicate sample
(a) = Erosion control basin
(b) = Sample missed holding time for 8260 analysis

Table 5b.
Surface Water Sampling Results for Metals
North Fork Strawberry Creek
(Concentrations in μg/L)

	Sb	As	Ba	Be	Cd	Cr	Co	Cu	Pb	Hg	Mo	Ni	Se	Ag	Tl	V	Zn
MCL:	6	50	1000	4	5	50	NS	1000 (a)	15 (b)	2	NS	100	50	100 (a)	2	NS	5000 (a)
DATE																	
Aug-93	<20	<5	96	<1	<1	<10	<10	<5	<10	<1	15	<20	<10	7	<10	<10	93
	<20	<5	45	<1	<1	<10	<10	<5	<10	<1	<5	<20	<10	<5	<10	40	8
Jul-94	<100	<2	<100	<10	<5	<10	<10	<10	<5	<0.20	<10	<50	<2	<10	<5	<50	<50
	<100	2	<100	<10	<5	<10	<10	<10	<5	<0.20	<10	<50	<2	<10	<5	<50	<50
Jul-95	<4	<2	<100	<10	<5	<10	<10	<10	<5	<0.20	<10	<50	<2	<10	<5	<50	<50
Jan-96	<4	2.4	<100	<10	<5	<10	<10	<10	<5	<0.20	<10	<50	<2	<10	<5	<50	<50
Apr-96	<50	<2	<50	<5	<40	<50	<50	<50	<40	<0.20	<50	<50	<1	<50	<50	<50	<20
Apr-97	<4	<2	104	<4	<5	<5	<5	<5	<5	<0.20	<50	<50	<2	<5	<1	<5	<20
Jan-98	<1	<2	40.2	<1	<1	<5	<5	2.3	<1	<0.10	<5	<5	<2	<1	<1	4.3	8.8
Apr-98	<1	<2	48.7	<1	<1	1.0	<1	1.9	2.9	<0.20	1.4	<1	5.2	<1	<1	5.1	6.9
Apr-99	<1	4.2	76.9	<1	<1	8.6	<1	1.2	<1	<0.25	2.5	<1	4.5	<1	<1	15.9	9.3
Jan-00	<1	<2	41.0	<1	<1	2.5	<1	4.6	<1	<0.10	1.6	1.5	<2	<1	<1	5.4	51.6

MCL: Maximum contaminant level for drinking water (determined by California DTSC)
(a): secondary MCL
(b): action level
(c): erosion control basin
NS: Not Specified

[shaded] < = Not detected above quantitation limit
[blank box] = Not analyzed

Table 6a.
Sediment Sampling Results for Organics and Fuels
North Fork Strawberry Creek
(Concentrations in mg/kg)

Sample ID	Date	VOCs (8240)	SVOCs (8270)	PCBs (8080)	TPH-Gasoline	TPH-Diesel
SSBC-1A/2A-0.4	Apr-93	ND	ND		49*	<0.2
SSBC-3A/4A-0.5/0.8	Apr-93	Toluene=0.013	ND		<5*	<0.2
SS-NFSTRAW-98-1-0.0	Jan-98			<0.02		
SS-NFSTRAW-98-2-0.0	Jan-98			<0.02		
SS-NFSTRAW-98-3-0.0	Jan-98			<0.02		

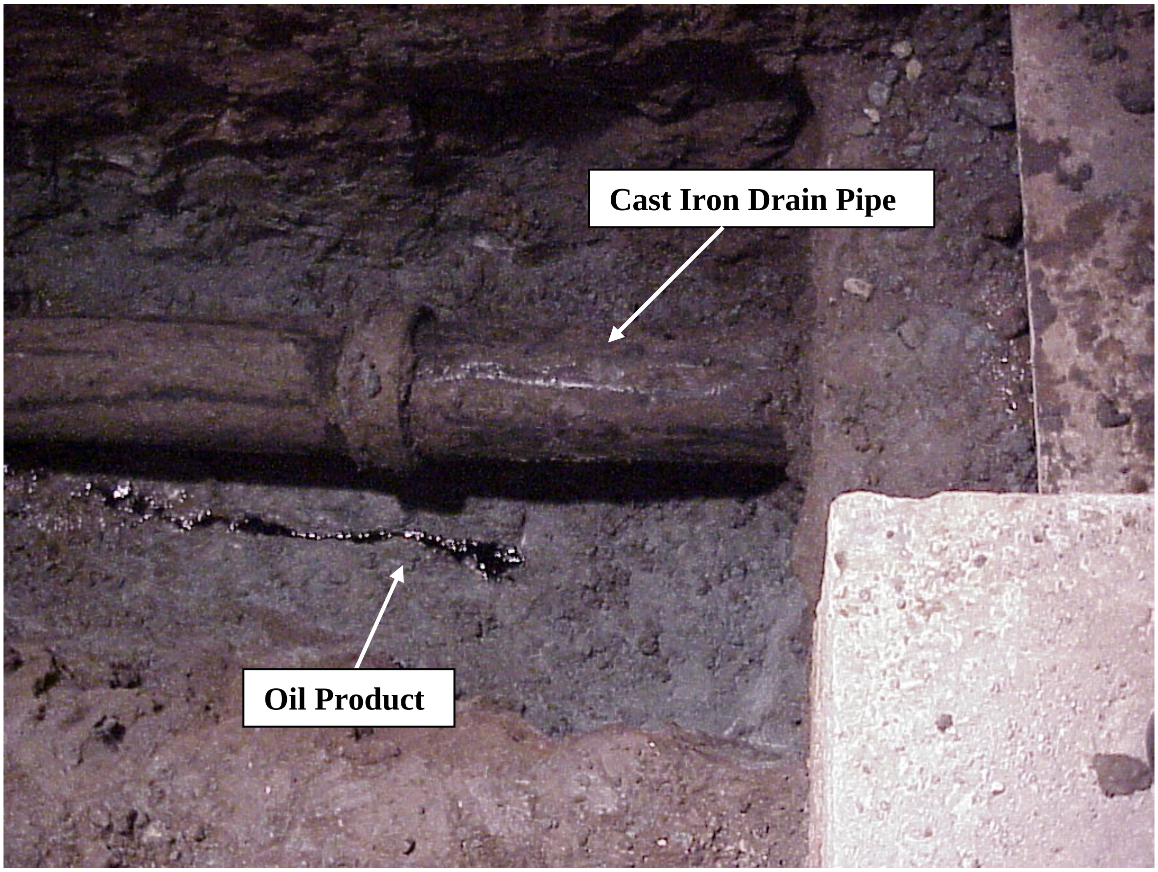
ND = Not detected above quantitation limit
< = Not detected above quantitation limit
* = Oil detected

Table 6b.
Sediment Sampling Results for Metals
North Fork Strawberry Creek
(Concentrations in mg/kg)

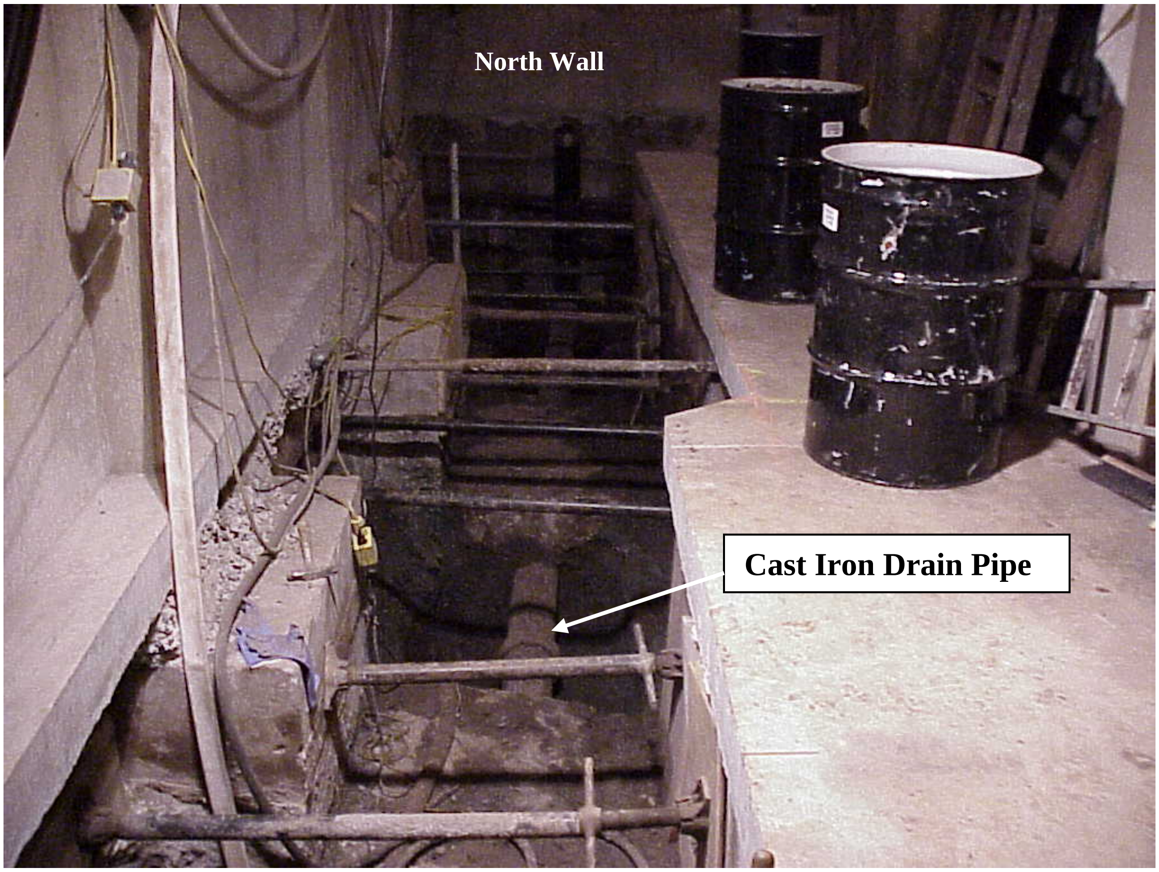
Sample ID	Date	Sb	As	Ba	Be	Cd	Cr	Cr6	Co	Cu	Pb	Hg	Mo	Ni	Se	Ag	Tl	V	Zn
SSBC-1A/2A-0.4	Apr-93	<2	3	140	<0.2	0.6	59		8.9	47	180	0.3	0.6	32	<2	3.5	<3	28	160
SSBC-3A/4A-0.5/0.8	Apr-93	<2	5	79	<0.2	0.6	45		11	40	53	0.6	<0.6	38	<2	<0.2	<3	35	160
SS-ERBAS-N-L-1-0 (a)	Jan-95											<0.2							
SS-ERBAS-N-U-1-0 (a)												<0.2							
SS-ERBAS-S-U-1-0 (a)												<0.2							
SS-ERBAS-S-L-1-0 (a)												<0.2							
SS-ERBAS-S-U-2-0 (a)	Jul-95	<5	2.6	334	<0.5	<0.5	36		6.8	28	17	<0.2	<2.5	26	<0.5	<1	5.4	31	130
SS-ERBAS-S-U-3-0 (a)		<5	1.9	93	<0.5	0.57	42		6.5	38	73	<0.2	<2.5	29	<0.5	<1	<5	32	259
SS-ERBAS-S-U-4-0 (a)		<5	2.0	52	<0.5	0.5	33		8.0	55	45	0.22	<2.5	27	<0.5	<1	<5	29	182
SS-ERBAS-S-U-5-0 (a)		<5	2.5	47	<0.5	<0.5	79	<1*	6.8	216	69*	<0.2	<2.5	27	<0.5	<1	<5	32	314
SS-NFStraw-96-1A-0	Aug-96	<10	3.5	98	<1	<1	129		7.1	19	17	<0.2	15	105	1.0	<2	<10	37	109
SS-NFStraw-96-2A-0		<10	4.7	83	<1	1.2	43		8.7	30	49	<0.2	<5	27	1.6	<2	<10	53	108
SS-NFStraw-96-3A-0		<10	9.2	1300	<1	2.5	21		13	44	21	<0.2	<5	181	2.6	<2	<10	48	148
SS-NFStraw-96-4A-0		<10	4.1	78	<1	<1	31		6.1	18	20	<0.2	<5	20	1.1	<2	<10	37	115
SS-NFStraw-96-5A-0		<10	4.2	81	<1	<1	29		7.3	26	19	<0.2	<5	22	1.0	<2	<10	49	144
SS-NFStraw-FL-99-1-0	Jul-99							<0.1											
SS-NFStraw-BSN-99-1-0 (a)								<0.1											

< (shaded) = Not detected above quantitation limit
(blank) = Not analyzed
(a) = erosion control basin
* = Additional waste extraction test (WET) performed: CrVI<1 mg/L; Pb = 4.3 mg/L.

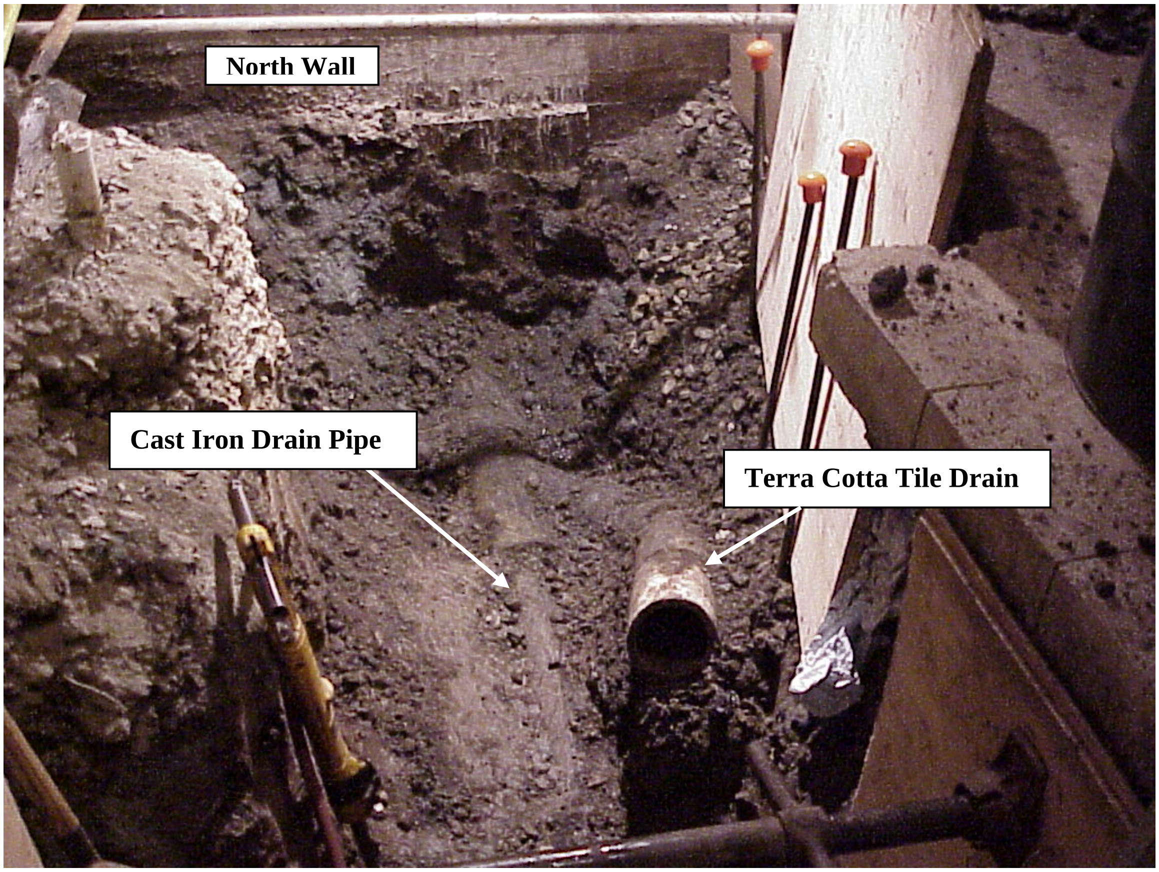
LIST OF PHOTOGRAPHS



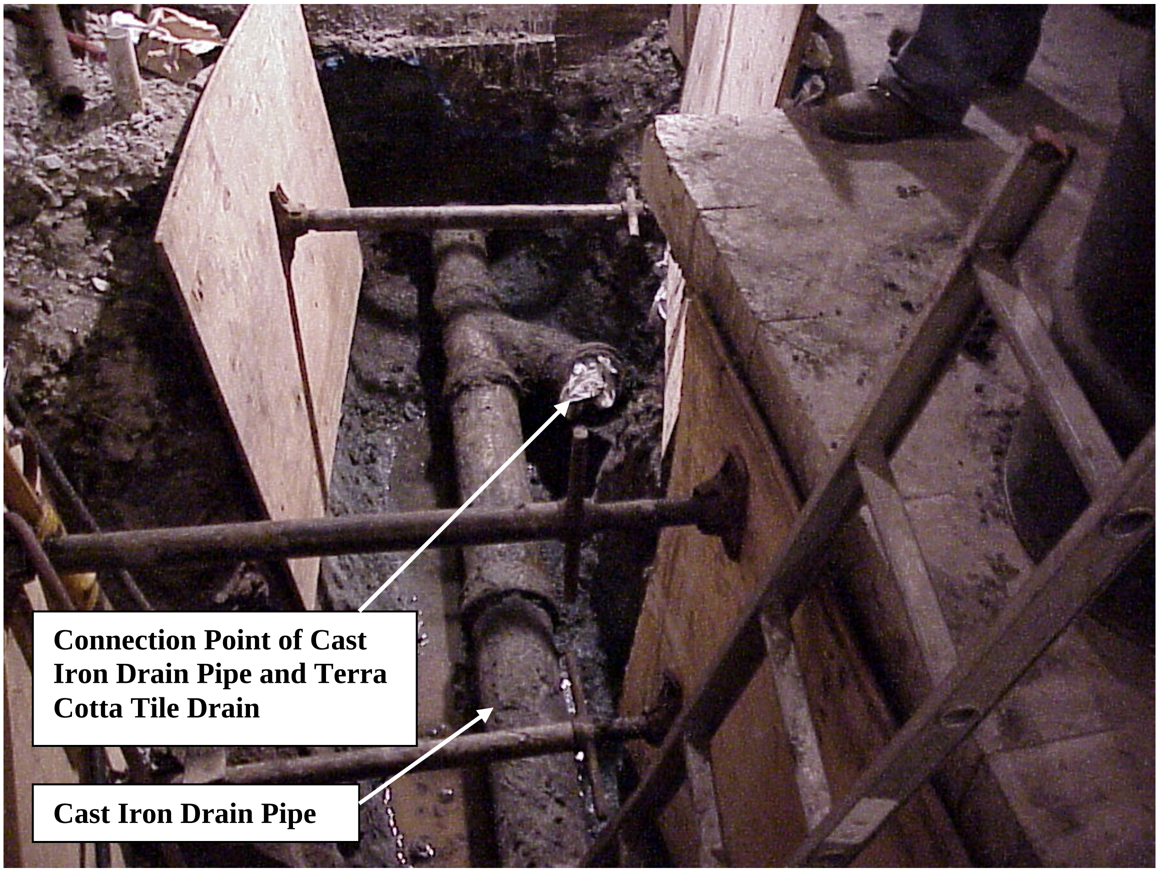
Photograph 1. Oil Product Near the Cast Iron Pipe in Test Pit 3, Building 51 Motor Generator Room Basement.



Photograph 2. View Northward of Test Pit 3, Building 51 Motor Generator Room Basement.



Photograph 3. Detailed View of Northward Extent of Test Pit 3, Showing Connection of Terra Cotta Drain Line with Cast Iron Drain Pipe, Building 51 Motor Generator Room Basement.



Photograph 4. Connection Point of Cast Iron Pipe and Terra Cotta Drain Line, Test Pit 3 Extension, Building 51 Motor Generator Room Basement.

Photograph 5. Discharge Sump During Cleaning Operations,
Building 51 Motor Generator Room Basement.

Photograph 6. Vacuum Truck Used During Cleaning Operations of Cast Iron Pipe, Building 51 Motor Generator Room Basement.

Photograph 7. Cleaning Operations of Cast Iron Pipe, Building 51
Motor Generator Room Basement.

Photograph 8. Vacuum Truck and Storage Tank During Cleaning Operations of Cast Iron Pipe, Building 51 Motor Generator Room Basement.